

**ARTIFICIAL GROUND FREEZING AND FROST
HEAVE DEFORMATIONS IN VIENNA SUBWAY**

**Master Thesis by
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**Programme: Soil Mechanics and
Geotechnical Engineering**

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JUNE 2006

PREFACE

First, I would like to thank my family who has always supported me and believed in me. Moreover, I thank my supervisor Prof. Mete İncecık, Prof. Lothar Martak from Vienna University of Technology and Assist. Prof. Berrak Teymür. I also want to thank the people, who gave me the opportunity to spend ten months in beautiful Vienna as an exchange student.

May 2006

N. Fatih Akdeniz

ÖNSÖZ

Öncelikle bana desteklerini hiç esirgemeyen ve başarıma inançlarını hiç kesmeyen aileme teşekkür ederim. Ayrıca danışman hocam Prof. Mete İncecik'e, Viyana Teknik Üniversitesi'nden Prof. Lothar Martak'a ve yardımlarını esirgemeyen Yar. Doçent Berrak Teymür'e içtenlikle teşekkür ederim. Son olarak, değişim öğrencisi olarak Viyana'da on güzel ay geçirmemi sağlayan herkese ve beni yalnız bırakmayan tüm arkadaşlarıma teşekkür ederim.

Mayıs 2006

N. Fatih Akdeniz

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ARTIFICIAL GROUND FREEZING AND FROST HEAVE DEFORMATIONS IN VIENNA SUBWAY

SUMMARY

Frozen ground is soil or rock with a temperature below 0 °C. Under this temperature, water turns into ice and it binds the soil particles where ground becomes an impervious layer. At the same time, strength of the soil increases and it can provide a strong and water-tight barrier for excavations and other types of civil works.

Use of frozen soil in civil works is defined as artificial ground freezing (AGF). This technique has been used for more than a hundred years. Frozen soil walls are created by installing freezing pipes in which coolant medium is circulated and temperature around the pipes decreases. Thus, frozen columns are formed around the pipes. Gradually, frozen columns merge and form a frozen wall which is impervious to water and high in strength.

In the applications of ground freezing, vertical deformations can be seen. These deformations are due to formation of ice lenses. The phenomenon is called frost heave. Frost heave is also seen in permafrost regions where ground is frozen continuously. Design considerations in AGF applications are made by estimating these elevations. Moreover, pavements are damaged and other problems occur in permafrost regions as a result of this phenomenon.

In this thesis, freezing process and properties of frozen soil is investigated. Furthermore, a case history of a ground freezing application in the construction of Vienna subway is mentioned. This method is executed in the construction of tunnels under Danube Canal. The process and application of the method is explained. Finally, temperature measurements along the tunnel axis and topographic measurements on the surface are examined in the concept of frost heave. This work was done within the Erasmus exchange program in Vienna.

YAPAY ZEMİN DONDURULMASI VE VİYANA METROSUNDAKİ DONMA KABARMALARI

ÖZET

0 °C'ın altındaki zeminler donmuş zemin olarak adlandırılır. Bu sıcaklığın altında su donarak buz haline geçer ve zemin tanelerini birbirine bağlayarak geçirimsiz bir tabaka oluşturur. Aynı zamanda mukavemeti de artmış olan donmuş zeminden kazılarda geçici iksa olarak yararlanılabilir.

Donmuş zeminin inşaat işlerinde kullanılmasına yapay zemin dondurulması olarak adlandırılır ve yüz yıldan fazla zamandır çeşitli uygulamalarda kullanılmaktadır. Yöntem zeminin içerisine dondurma borularının yerleştirilmesi esasına dayanır. Bu borulardan sıvı nitrojen veya tuzlu su çözeltisi geçirilerek zemin soğutulur ve dondurma borularının etrafında donmuş zemin kolonları oluşturulur. Zamanla bu kolonlar birleşerek geçirimsiz ve mukavemeti yüksek bir duvar meydana getirir.

Zeminin donması veya yapay olarak dondurulması sırasında dikey deformasyonlar gözlemlenebilir. Bu kabarmalar zeminde buz kristallerinin oluşmasının bir sonucudur ve donma kabarması olarak adlandırılır. Bu kabarmalar kaldırım ve yol yapılarında çatlaklara yol açar. Bu yüzden yapay zemin dondurulması uygulamalarının tasarımında donma kabarmalarının hesaplanması önemlidir.

Bu çalışmada zeminin donma süreci ve donmuş zeminin fiziksel ve mekanik özellikleri incelenmiştir. Ardından yöntemin Viyana Metrosu'ndaki uygulaması anlatılmıştır. Metronun istasyon tünellerinin açılmasında kullanılan yöntemin aşamaları gösterilmiştir. Son olarak, zeminin dondurulması sırasında tünel boyunca ölçülen sıcaklıklardan donan zeminin kalınlığı tahmin edilmiş ve yüzeyde yapılan topoğrafik ölçümlerle birlikte donma kabarmalarıyla ilgisi incelenmiştir. Bu çalışma Erasmus öğrenci değişimi programı ile Viyana'da gerçekleştirilmiştir.

1. INTRODUCTION

Frozen ground is soil or rock with a temperature below 0 °C. Under this temperature, water turns into ice and it binds the soil particles where ground becomes an impervious layer. At the same time, strength of the soil increases and it can provide a strong and water-tight barrier for excavations and other types of civil works.

Use of frozen soil in civil works is defined as artificial ground freezing (AGF). This technique has been used for more than a hundred years. Frozen soil walls are created by installing freezing pipes in which coolant medium is circulated and temperature around the pipes decreases. Thus, frozen columns are formed around the pipes. Gradually, frozen columns merge and form a frozen wall which is impervious to water and high in strength.

Ground freezing is used in various civil engineering applications. These applications are deep excavations, underpinning of foundations adjacent to an excavation, temporary stabilization of a landslide during remedial work, shafts, deep trenches and tunnels. Use of the method in shallow and deep excavations is shown in figures 1.1 and 1.2. Freezing method provides both shallow and deep excavations without bracing or struts. Frozen soil has very low permeability (less than 10^{-10} cm/sec). Therefore, this method cuts off groundwater completely and eliminates dewatering works. Shoring systems, which are designed with ground freezing method, are cost competitive compared to other types of shoring systems such as sheet piles, soldier pile walls, secant concrete piles or jet grouting. Moreover, ground freezing is used in tunnelling applications (figure 1.3). It provides stable shoring to allow tunneling in wet, loose soils or fractured bedrock (www.cyrocell.com).

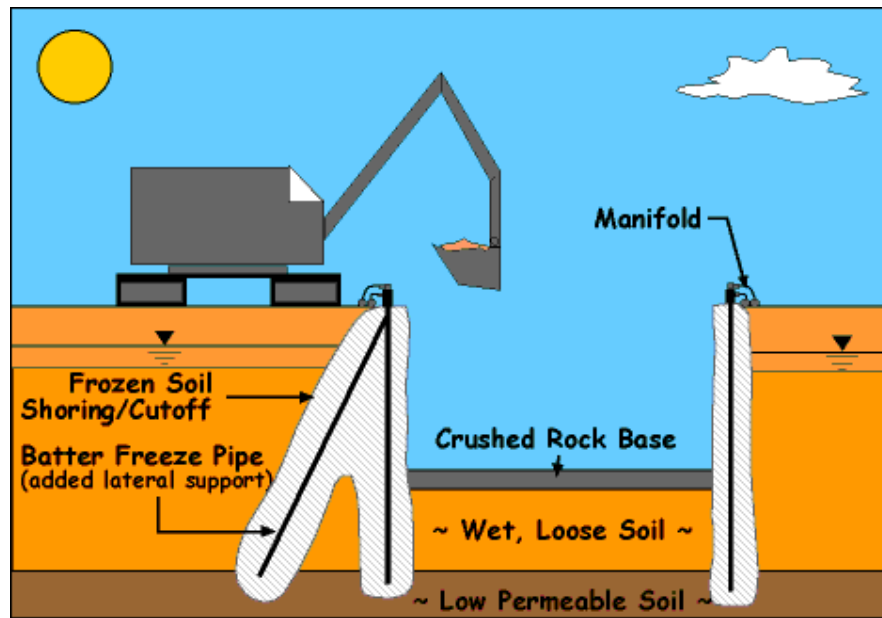


Figure 1.1 Shallow excavations (www.cyrocell.com)

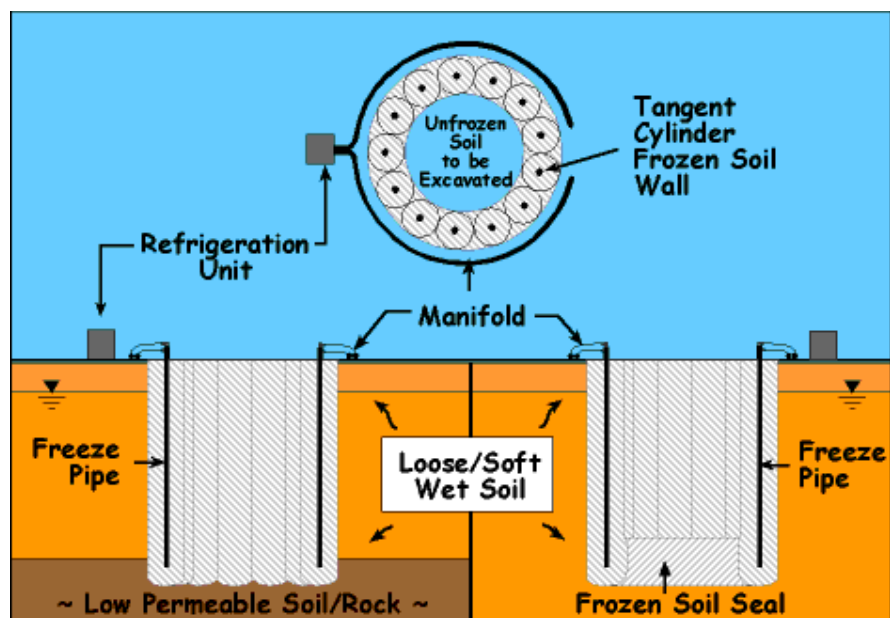


Figure 1.2 Deep excavations (www.cyrocell.com)

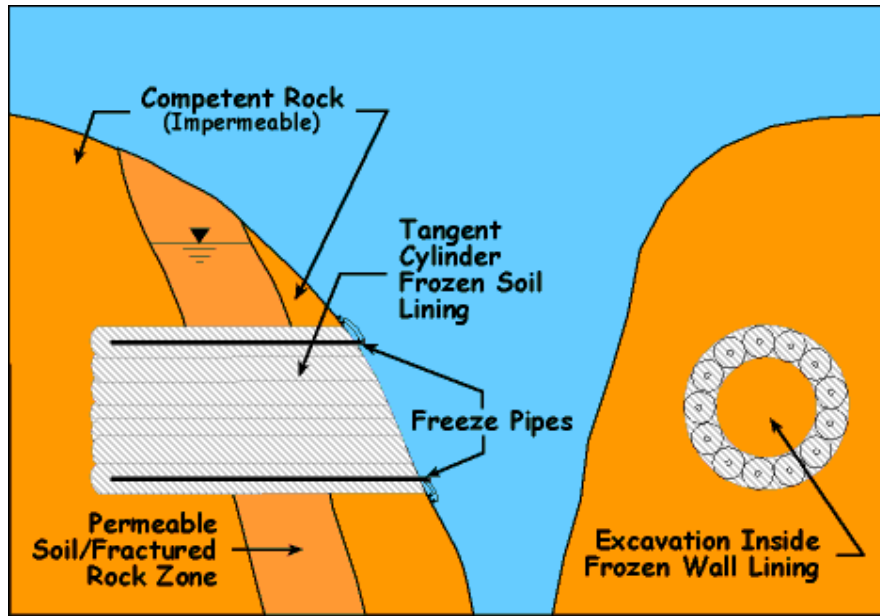


Figure 1.3 Tunneling applications (www.cyrocell.com)

Furthermore, ground freezing can be used as ground improvement method in order to protect existing buildings. Usage of the method in underpinning applications is shown in figure 1.4. With the employment of the method, vertical and horizontal movements of nearby structures are prevented (www.cyrocell.com)

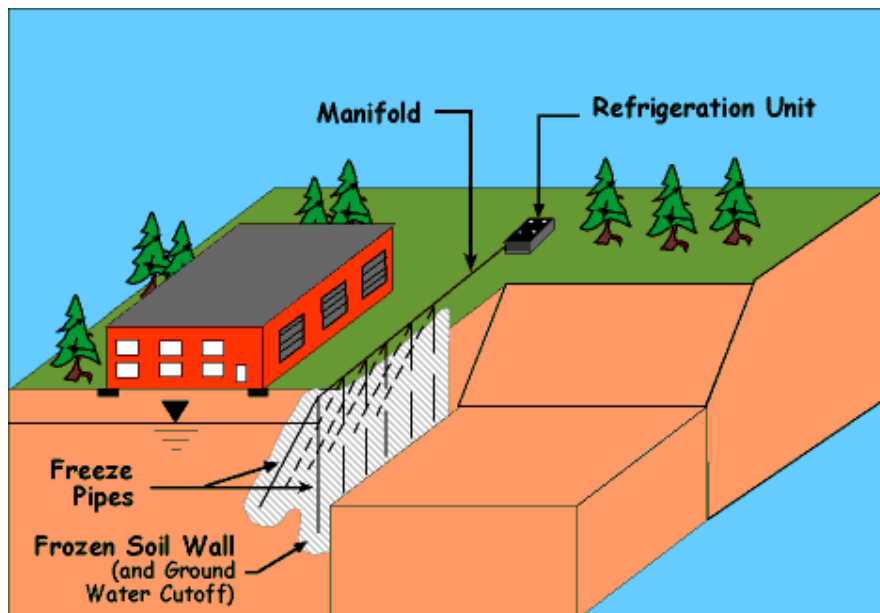


Figure 1.4 Underpinning applications (www.cyrocell.com)

In the applications of ground freezing, vertical deformations can be seen. These deformations are due to formation of ice lenses. The phenomenon is called frost

heave. Frost heave is also seen in permafrost regions where ground is frozen continuously. Design considerations in AGF applications are made by estimating these elevations. Moreover, pavements are damaged and other problems occur in permafrost regions as a result of this phenomenon.

In this thesis, freezing process and properties of frozen soil is investigated. Furthermore, a case history of a ground freezing application in the construction of Vienna subway is mentioned. This method is executed in the construction of tunnels under Danube Canal. The process and application of the method is explained. Finally, temperature measurements along the tunnel axis and topographic measurements on the surface are examined in the concept of frost heave. This work was done within the Erasmus exchange program in Vienna.

2. FROZEN SOIL

In this chapter, freezing process is investigated and formation of ice lenses is explained. Moreover, physical and mechanical properties of frozen soils are given.

2.1 Freezing Process

As the temperature is decreased in fine grained, saturated soil, water in the pores of soil and adsorbed water become ice crystals. These crystals form ice lenses which are generally normal to the direction of heat transfer and parallel to each other. They exist often in repeated layers (Everdingen, 2002).

In figure 2.1, freezing process of frozen soils is shown. When water is frozen, its volume expands about 9%. Below the frozen soil, a region which is called frozen fringe exists. In frozen fringe the change of phase is seen and it is the transition zone of unfrozen and frozen soil. Both ice and water coexist in this zone. During freezing, water migration occurs from the unfrozen part of the soil to the freezing front. This migration feeds the formation of new ice lenses. Then, segregated ice forms. Therefore, soil volume is expanded and a vertical displacement is seen (Talamucci, 2003). This process is known as Frost Heave. Although the volume of the water is increased while it is frozen, it has only a minor effect to frost heave. The major effect is the transportation of the water from unfrozen region. A suction force, which is called Cryosuction, causes the migration of water. Cryosuction is a result of temperature-dependent differences in unfrozen water content (Everdingen, 2002).

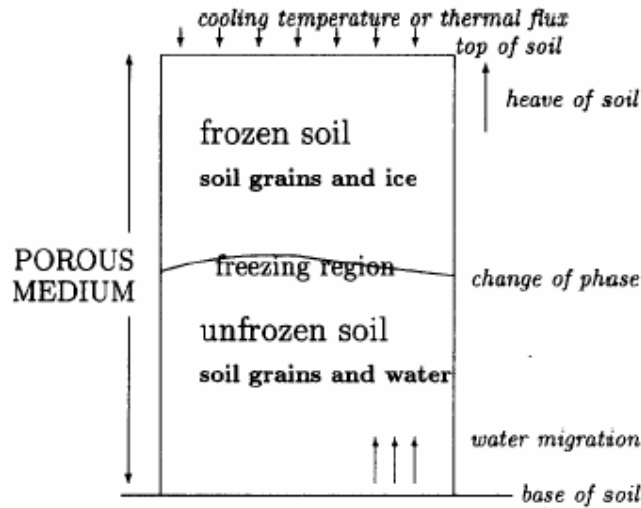


Figure 2.1 Freezing Process (Talamucci, 2003)

While fine grained soils cause spectacular heave, coarse grained soils do not heave at all. Therefore, the soils, which are effected from frost heave, are called frost susceptible soil. The degree of frost susceptibility is a function of percentage of fine particles within the soil (Phukan, 1985).

In figure 2.2, cooling is applied from the upper surface of a cylindrical clay sample. A series of dark ice lenses are formed. As a result, surface of the sample heave with a distance equal to the thickness of ice lenses (Rempel and Co.). Frost heave is a common problem in permafrost regions. In these regions, ground is frozen permanently or cyclically. Therefore the ground is heaved and cracks occur on the surface of roads.

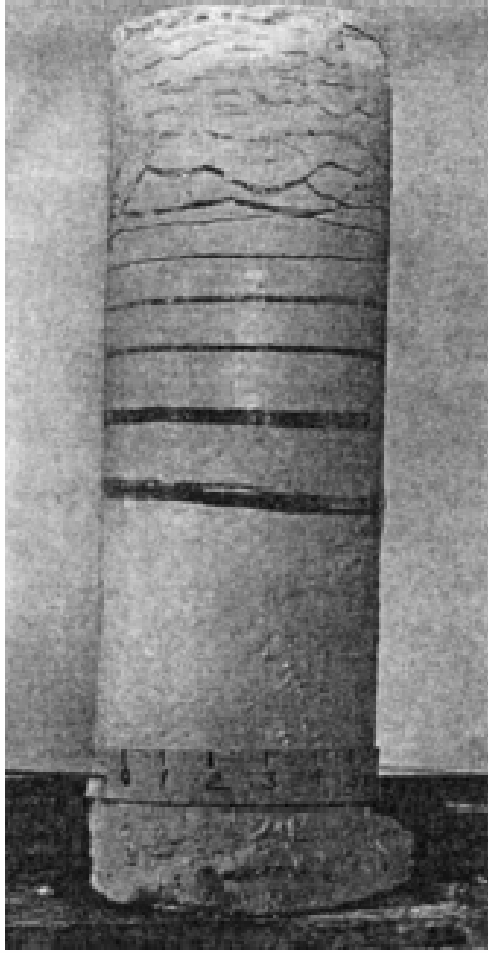


Figure 2.2 Frost Heave (Rempel and Co.)

2.2 Frozen Soil Constituents

Similar to the unfrozen soil, frozen soil is a multiphase, complex material. The soil structure is shown in four phases in figure 2.3. Solid phase consists of soil particles, which are mineral particles and organic. Ice is a highly plastic material and its properties depend on temperature, the magnitude and the duration of load. Liquid phase is when water is in the pores of soil. Even at -10°C unfrozen water, that separates ice from the soil particles, exists. Temperature, specific surface area of mineral particles, mineral type, pore size distribution and salinity control the unfrozen water amount in frozen soil. The direct methods of dilatometry, adiabatic calorimetry, x-ray defraction, heat capacity and nuclear magnetic resonance are used in order to define the amount of unfrozen water in frozen soil. Gas phase is when air fills voids that are not occupied by liquid (Phukan, 1985).

Gas
Unfrozen Water
Ice
Solid Phase

Figure 2.3 Phases of frozen soil

2.3 Mechanical Properties of Frozen Soils

The structure of frozen soil is composed of soil particles, ice, water and air. Frozen soils, whose ice content is less than 30% by volume; are called ice-poor frozen soil. Generally, their strength is controlled by interparticle frictional forces. Moreover, the strength of ice-rich frozen soils is managed by cohesive forces in the soil-ice matrix system. Ice binds together the soil particles and strengthens the link among particles. Stresses are distributed between ice and the soil skeleton. Therefore, the characteristics of ice greatly affect the strength of frozen soil. The properties of ice depend on temperature, magnitude and duration of load. Ice is instable under the change of temperature and load. As a result, mechanical properties of frozen soils are more complicated than unfrozen soils (Phukan, 1985).

2.3.1 Compressive Strength of Frozen Soils

The strength of frozen soils relies on strain rate, ice content and temperature. Experiments show that increasing strain rate and decreasing temperature strengthen frozen soils. In figure 2.4, stress – strain curves for uniaxial compression tests on frozen silt are shown. This figure demonstrates that the strength of the frozen soil increases while the strain rate increases. Furthermore, the failure mode is ductile with relatively small strain rates. Whereas the failure mode alters to brittle when the strain rate increases.

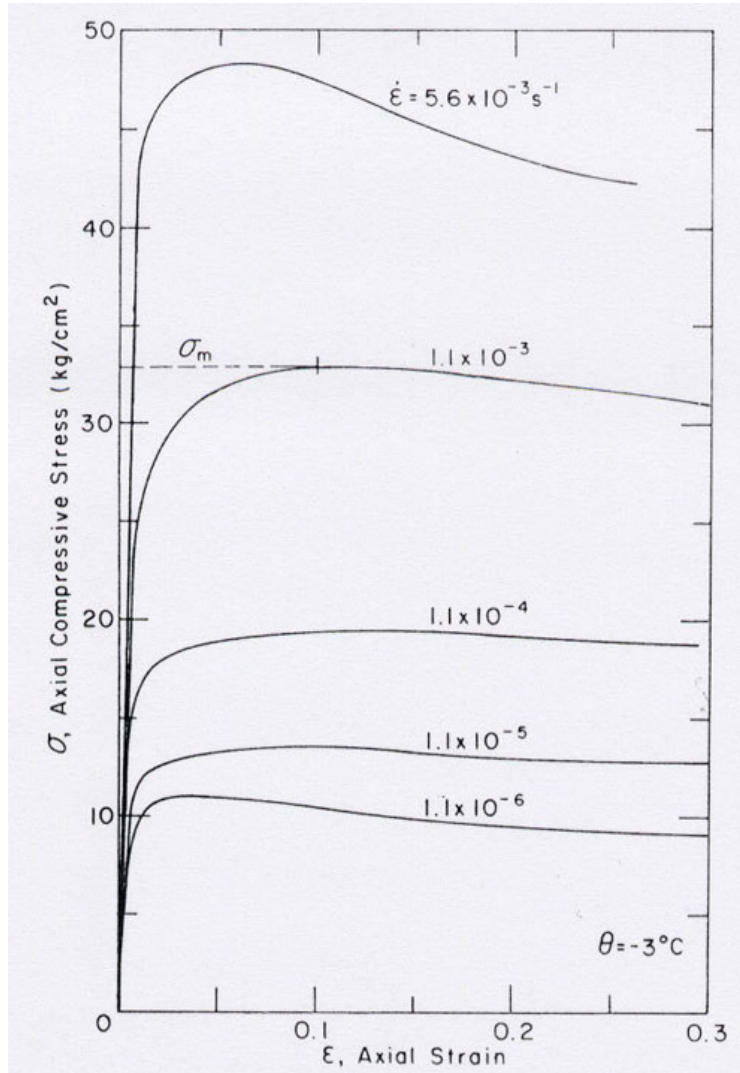


Figure 2.4 Stress – strain curves for uniaxial compression of remoulded silt (Harris, 1995)

2.3.2 Shear Strength of Frozen Soils

Shear strength of frozen soils is attributed to the resistance of ice and the friction between the soil particles. Vyalov (1962) modified the Mohr-Coulomb failure theory in order to estimate the shear strength of frozen soils.

$$\tau = C_t + \sigma_n \tan \phi_t \quad (2.1)$$

τ is shear strength, σ_n is normal stress on shear plane and C_t and ϕ_t are cohesion and friction angle which are the functions of temperature and time.

The amount of ice and temperature affects the cohesion. From the results of experiments, following equation was suggested in order to define the cohesive component (Vyalov, 1962):

$$C_t = \frac{\beta}{\log (t/B)} \quad (2.2)$$

where β and B are the constants, which are found from C_t versus $\log t$ graph and t is the time period.

Internal friction angle depends on distribution, shape and the number of grain to grain contacts as in unfrozen soils. Moreover ice content and temperature affect the angle of internal friction.

2.3.3 Creep Behaviour of Frozen Soils

Creep behaviour of frozen soils is the time dependent deformation under constant stresses. The creep process of frozen soils is as follows;

1. As a result of pressure, ice melts at points of soil – grain contact.
2. Unfrozen water in the soil migrates to areas, which are under lower stresses.
3. Ice – soil structure collapses.
4. Plastic deformation of ice in the pores of soil occurs.
5. Linkage of ice – soil particles remodels.

Readjustment of frozen soil structure is denser and internal friction between soil grains is greater than they are before the creep process. Therefore, the strength of material increases unless the applied load exceeds the long-term strength of the frozen soil. The long-term strength, which is also called creep strength, is the failure strength, when the strain rate tends to zero or time goes to infinity. This is the primary stage (strain-hardening) of the creep behaviour of frozen soils. If the applied load surpasses the creep strength, strengthening process stops and soil starts to weaken. According to the measurements, secondary (linear) stage is not clear. Hence, it is defined as an inflection point (m), which is the minimum strain rate of the soil. The inflection point is defined as failure for engineering designs. Finally, strain rate increases and failure occurs. The creep behaviour of frozen soils is shown in figure 2.5 and idealized time-dependent behaviours of frozen soils are given in figure 2.6.

Moreover, the amount of ice in frozen soils also affects the deformation behaviour. Ice-rich frozen soils demonstrate mainly secondary creep, while on the contrary ice-poor frozen soils' dominant behaviour is primary creep (Phukan, 1985).

In order to define the creep curves, models were proposed. Most of these models are based on the works of Vyalov (1962). Total strain ϵ is given as follows:

$$\epsilon = \epsilon_0 + \epsilon_d + \epsilon_c \quad (2.3)$$

Here ϵ_0 , ϵ_d and ϵ_c are initial, delayed and irrecoverable creep strain respectively.

ϵ_c is much more greater than $(\epsilon_0 + \epsilon_d)$, therefore they are disregarded in the computations. Assur (1963) modified this equation and suggested the following:

$$\epsilon_c = \left[\frac{\sigma t^\lambda}{w \left(\frac{T}{T_0} + 1 \right)^k} \right]^{1/m} \quad (2.4)$$

In this equation, σ is applied stress, t is time, T is the temperature ($^{\circ}\text{C}$) below freezing, T_0 is the reference temperature and w , λ , m and k are constants which are defined according to soil type. This equation is simplified by Klein (1979) to:

$$\epsilon_c = A \sigma^B t^C \quad (2.5)$$

A , B and C are constants in this equation. Some of the values of these parameters are shown in table 2.1.

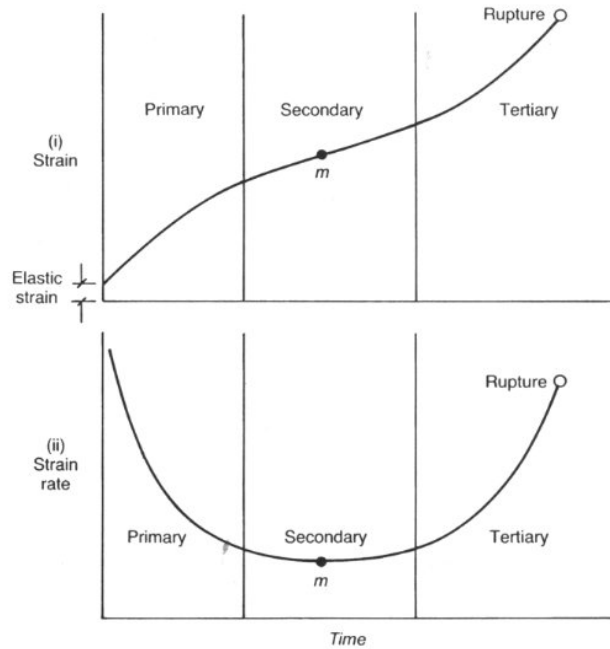


Figure 2.5 Creep behaviour (Harris, 1995)

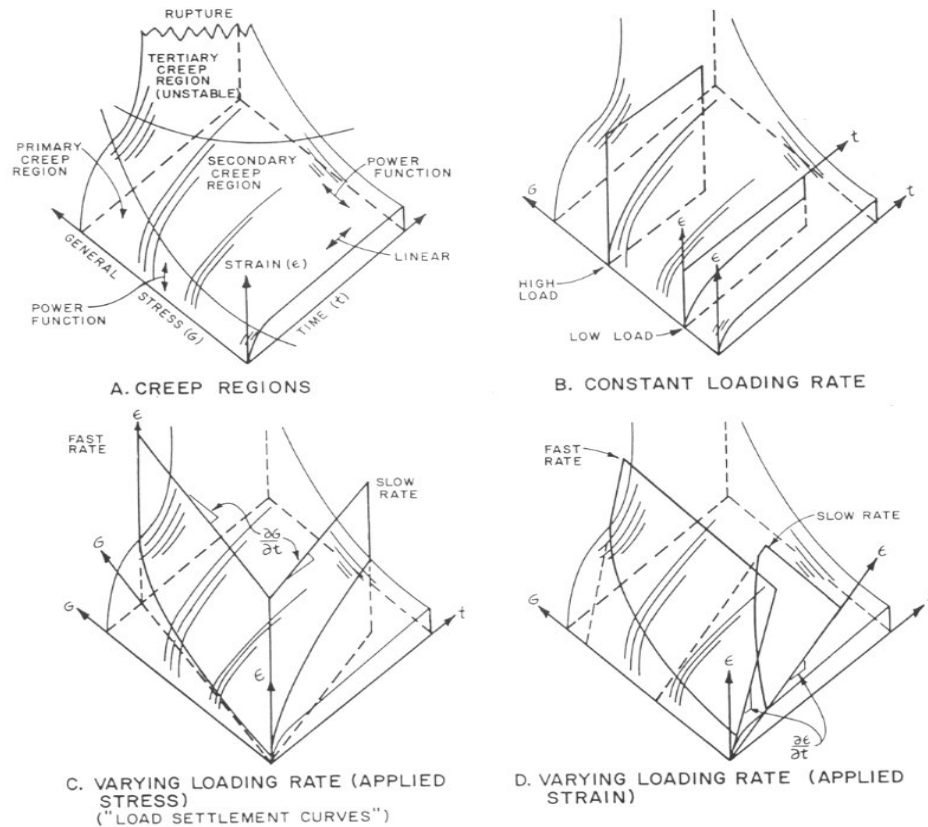


Figure 2.6 Idealized time-dependent stress-strain behaviour of frozen soils (Phukan, 1985)

Table 2.1 Creep parameters of frozen soils (Harris, 1995)

Material	T : °C	A: mPa ^{-B} x h ^{-C}	B	C
Ottawa sand	-9.4	3.50×10^{-4}	1.28	0.44
Manchester fine sand	-9.4	1.90×10^{-4}	2.63	0.63
Clayey fine sand	-10	8.20×10^{-3}	2.25	0.24
Sand	-10	1.67×10^{-3}	2.80	0.42
Bat-Baioss clay	-10	1.60×10^{-3}	2.50	0.45
Callovian sandy clay	-10	5.50×10^{-4}	3.70	0.37
Emscher marl	-10	7.60×10^{-5}	4.00	0.10
Silt	-10	7.90×10^{-6}	5.60	0.88
Silty clay	-10	5.99×10^{-3}	2.63	0.38
Oil sand	-10	1.18×10^{-2}	1.60	0.44
	-20	2.11×10^{-3}		

3. AN ARTIFICIAL GROUND FREEZING APPLICATION IN VIENNA

In this chapter, an artificial ground freezing application in Vienna subway construction is explained. First, basic information about the project is given. Second, public transportation system of the city, and future and current needs of public transportation is explained. Third, geology of the city and the construction site is presented. Finally, the construction method and process is explained.

3.1 Construction of U2 Station Schottenring

For the construction of U2 line to Stadlau/Aspern, which is currently under construction and planned to be finished by March 2008, an under-crossing of Danube canal between Franz Josefs-Kai and upper Danube Road is planned. Due to limited construction time, it was necessary to establish the Schottenring Station under a slight cover under former penstock's chamber and the weir of penstock in Danube canal. Most of the station is constructed with NATM (New Austrian Tunneling method). The construction contains two separate platform tunnels with side platforms. At both ends of the station, there are shafts, which are constructed with open construction method. These shafts, which are shown figure 3.1, are the exits to first and second districts. Construction works are performed in a limited area because of the existing subway station, which is operating (Martak and Herzfeld, 2005).

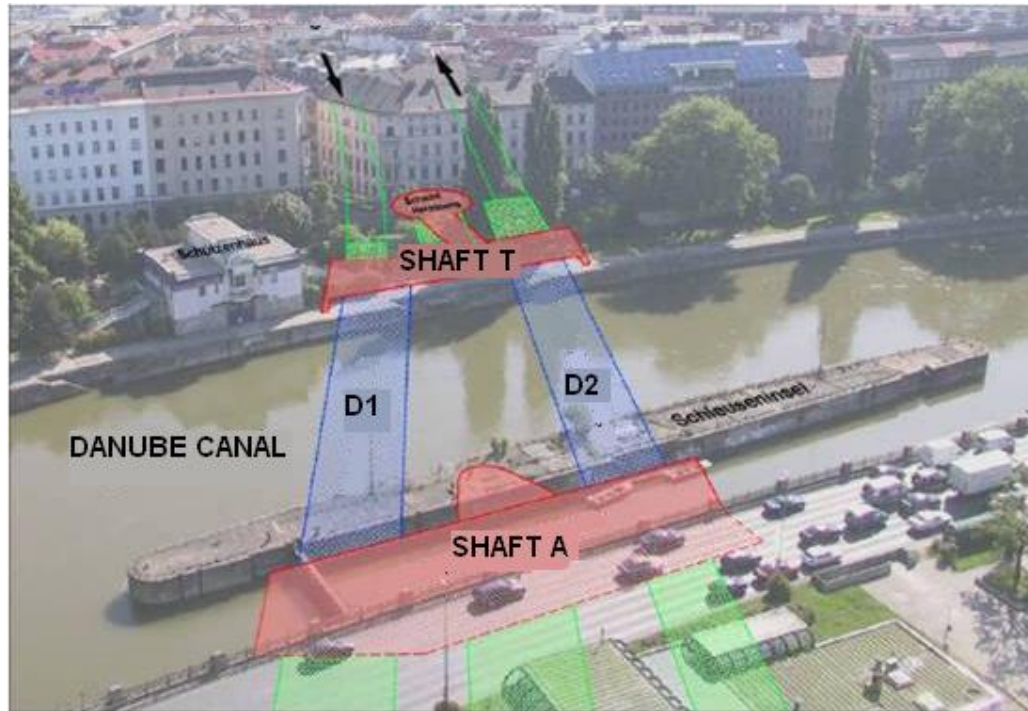


Figure 3.1 Layout plan of Danube canal under-crossing (Jöstl and Co., 2003)

3.2 Transportation of Vienna

3.2.1 Vienna Subway (U-Bahn)

Modern underground network consists of five lines with a total length of 61 kilometers. These lines are connected with other bus and tram lines in order to increase the proportion of journeys made by public transport.

Construction of the subway was first begun in 1969 with the Karlsplatz station. In the first stage of the construction between 1969 and 1982, U1 (10 km), U2 (3.6 km) and U4 (16.4 km) were constructed. U3 (13.5 km) and U6 (17.5 km) metro lines were accomplished between 1982 and 2000 for the second stage. In the third construction stage, U1 is extended from Kagran to Leopoldau (2006) and U2 is extended from Schottenring to the stadium, which is planned to be ready in 2008, then to Aspernstraße (2009). Following completion of the third construction stage in 2009 the underground network will have a total length of 74.6 kilometers. A fourth construction stage is defined in Transportation Master Plan 2003. Further expansions for U1, U2 and U6 are planned in this stage. Current and future subway lines are shown in figure 3.2 (www.wien.gv.at).

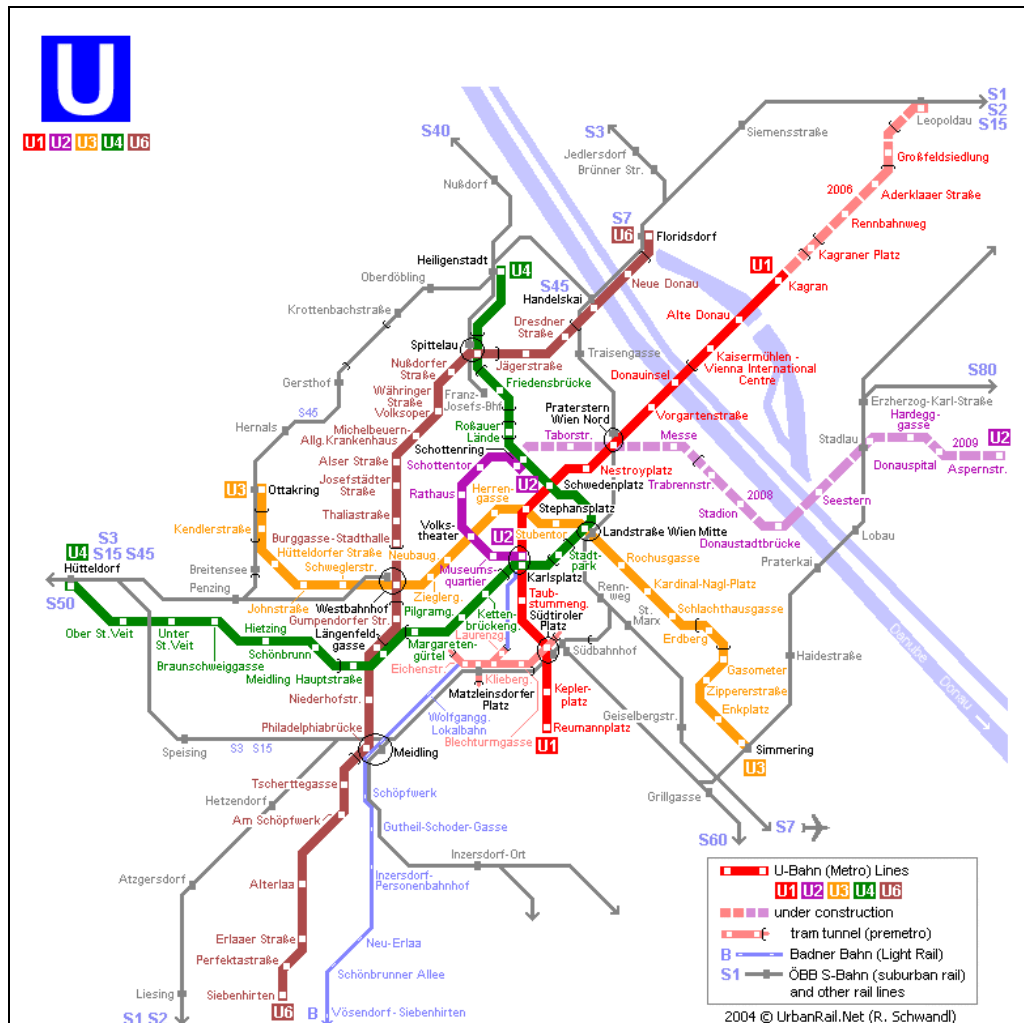


Figure 3.2 Subway network of Vienna (www.wien.gv.at)

3.3 Geology

Geology of Vienna and geology of the construction site is explained below.

3.3.1 Geology of Vienna

The geology of Vienna consists of different land forms. The Waldviertel is the flattened mountains of the Bohemian Massif, which is the big crystalline area in the middle of Europe. Crystalline and metamorphic rocks like granite, gneiss and slate can be found in this region. In the south, the bed of Danube River is in the crystalline area and it divides the Dunkelsteiner Forest from the rest of the Bohemian Massif. After this valley the Danube enters the flat foothills of the Alps, which stretch from the west to St. Pölten and the Tullner Feld and to the Weinviertel. Then it flows

through the easternmost foothills of the Alps (the Wienerwald) at Greifenstein-Klosterneuburg and crosses the Vienna Basin, which was formed in the Tertiary and is filled with sediments. Vienna Basin is between the Alps and the Carpathian mountains, two thirds of the Vienna Basin lie in Lower Austria and one third in Slovak territory. Austria's biggest oil and gas-fields exist in the Vienna Basin. Furthermore, there are thermal water zones and hot springs such as Baden and Bad Vöslau. The Wienerwald and the limestone Alps are at the west border of the Vienna Basin. The Rax and Schneeberg regions are at an altitude of 2000 m and they provide the drinking water of Vienna. The Vienna basin borders the crystalline regions Semmering, Bucklige Welt, Rosalien- and Leitha mountains in the south. During the ice ages Lower Austria was mostly ice-free. Sediments from the detritus of the moraines, which were formed in front of the glaciers, were blown away by the wind. This fine sand covers today wide areas of the Weinviertel. Figure 3.3 shows the geological map of Vienna (www.tiscover.at).

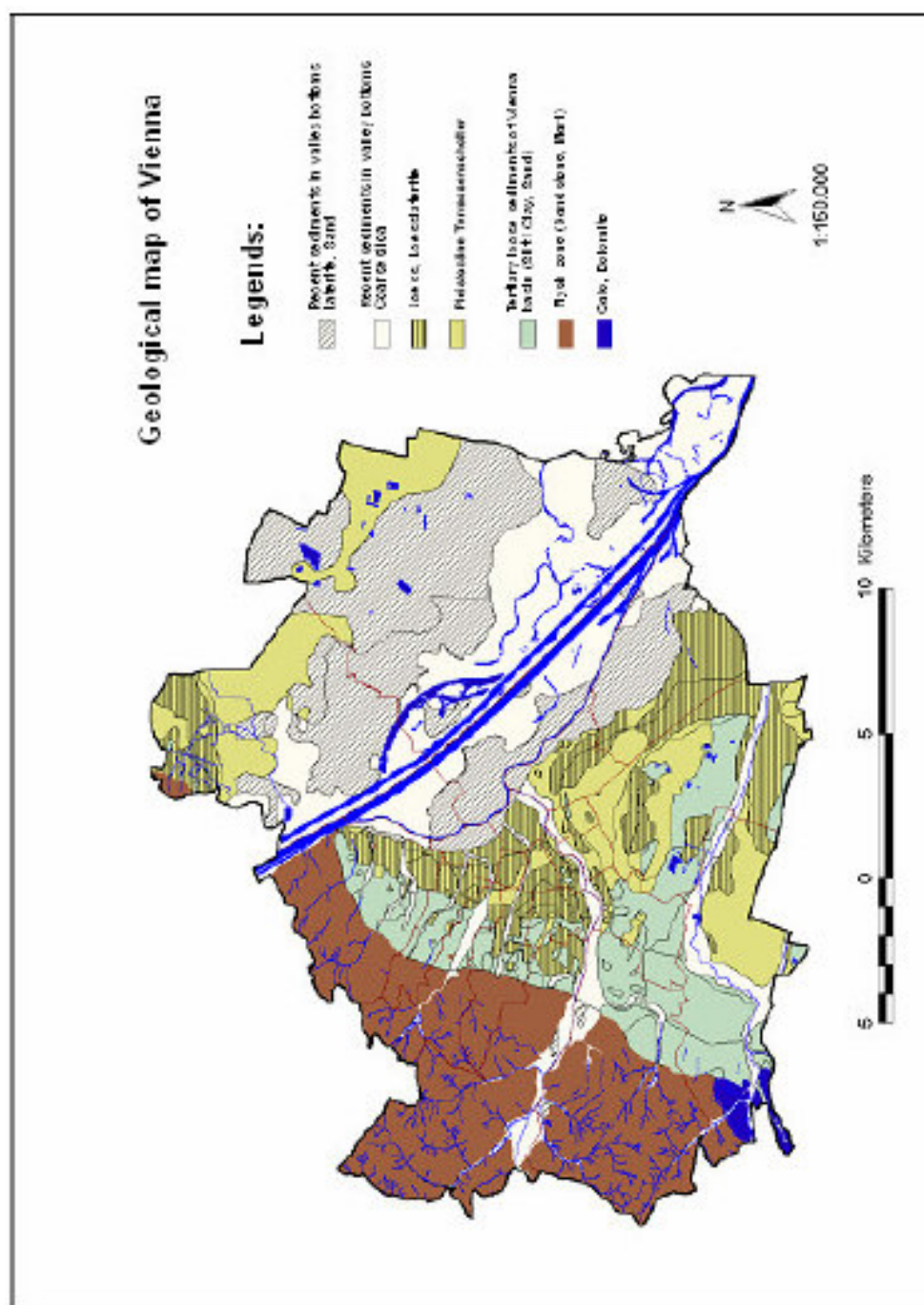


Figure 3.3 Geological map of Vienna (www.wien.gv.at)

3.3.2 Geology of the Construction Site

During the last centuries, main arm of the Danube channel in northeast of 1st district was shifted to the east several times. The situation today is the result of adjustments at the beginning of 19th century. The river bed is formed with sandy gravel, which has a thickness between 0.5 m and 1.5 m. River scours and bomb funnels reach to a depth of 5 m in some areas of the river bed. Moreover, concrete threshold of the military field with a thickness of 4 m can be found. These bomb funnels were replenished with debris World War 2 (Martak and Herzfeld, 2005).

The tertiary sediments in this region of the city are dominated by clayey silts, which are occasionally thin or 1 m thick layers. These hydraulically important intermediate layers can be seen in drillings (figure 3.4). The water-bearing layers are almost pure coarse silt with large hydraulic downward gradient. These layers characteristically liquefy and penetrate into the excavation area during shaft excavations or tunnel driving under atmospheric conditions (figure 3.5) (Martak and Herzfeld, 2005).



Figure 3.4 Drill core from the drilling in the Danube channel (clayey silt on the left, coarse silt on the right) (Martak and Herzfeld, 2005)



Figure 3.5 Pile drilling Shaft T – coarse silt discharging from the drilling bucket
(Martak and Herzfeld, 2005)

3.4 Construction Process and Method

Construction method had to be decided according to UVP 2000 (Umweltverträglichkeitsprüfung 2000 – Environmental Friendly Test 2000). Closed construction method, National Austrian Tunneling Method (NATM) with Artificial Ground Freezing (AGF) was chosen from the other investigated methods. Environmental acceptability in the official permission period and construction cost analysis was effective for the choice of the method (Jöstl and Co., 2003).

Following procedures were made as preparation for freezing;

- Geophysical groundwater measurements at the former penstock (Kaiserbadschleuse),
- Determination of the soil parameters for frozen soil drillings,
- Thermodynamic and static calculations for the frozen body,
- Estimation of frost heave,
- Temperature measurements through a borehole in Danube canal (Jöstl and Co., 2003).

3.4.1 Freezing Tests on Soil

Freezing tests are applied to tertiary, clayey and sandy soil, which were extracted from 8 borings, for the temperatures of -5 °C, -10 °C, -15 °C and -20 °C. Freezing and thawing cycles were simulated. After 6 freeze-thaw cycles under unloaded conditions, frost heaves between 12.86 mm and 17.48 mm were observed. The heaves decreased to values between 9.65 mm and 14.56 in the thaw cycles of all tests. Creep formations were between 2,2 % and 9,8 % (Jöstl and Co., 2003).

Furthermore, uniaxial compression tests were performed. The results (figure 3.6) show clearly that there is a corresponding between test temperatures and compressive strengths.

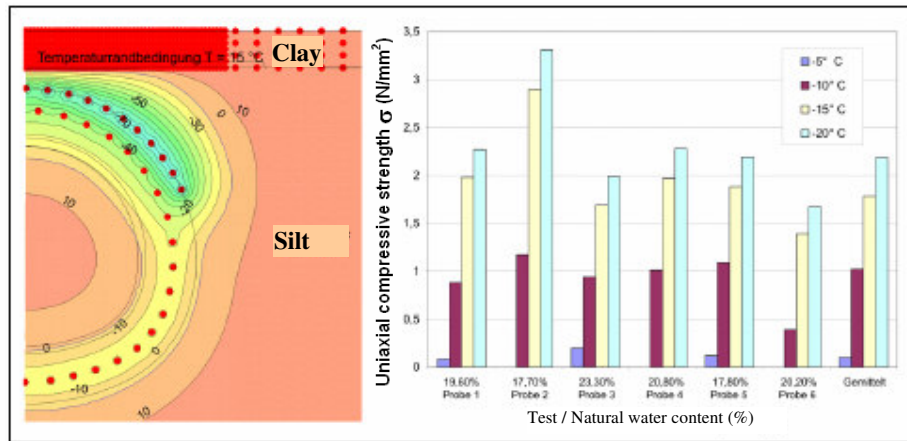


Figure 3.6 Estimated temperatures and compressive strength according to water content ratios (Jöstl and Co., 2003)

3.4.2 Choice of Combined Freezing Process

Following considerations were made in order to choose the combined freezing process.

- Danube canal flows at a rate of 2 m/s which makes it a strong thermal supply. Therefore, a freezing process with a high cooling capacity is necessary in order to minimize this influence;
- The clayey silt layer around the tunnel inclines to intensive heaves with the freezing procedure over the duration of several months, if water supply is enabled for the formation of ice lenses;

- The coarse clay layers are sufficiently water-permeable, to increase expansion of the volume, hence formation of ice lenses are provided as a result of strong suction pressure of clayey silt in frozen conditions with water supply. This process should be limited by the freezing procedure;
- If the soil around the tunnel driving becomes soft or working face during construction works, a fast high-energy capacity should be planned, especially in the direction of Danube canal's river bed;
- It is necessary to form about a 2 m thick frozen-ring around the entire tunnel driving, so that, the hydraulic upward movement of outer tunnel covering is limited (Martak and Herzfeld, 2005).

As a result of these requirements, two supplemental cooling techniques were planned. One of these techniques is liquid Nitrogen (LN_2), which has a high energy cooling potential. Nitrogen is at -196°C as liquefied gas under 1 bar. Therefore, Nitrogen was used for shock freezing in order to minimize the formation of ice lenses. Moreover, it was also a backup for the emergency situations, which could occur under the influence of Danube canal. In figure 3.7 storage tanks of LN_2 is shown (Martak and Herzfeld, 2005).



Figure 3.7 Storage tanks of liquid Nitrogen (LN_2)

Other technique is brine freezing process. This is a 30% CaCl_2 alkaline solution. Brine freezing is an economical and reliable method and it can keep the circular frost body in the desired temperature range between $-10\text{ }^{\circ}\text{C}$ and $-20\text{ }^{\circ}\text{C}$ several months. The freezing procedure lasts longer than the freezing period with LN_2 , which can lead to formation of ice lenses and frost heaves. However, it can be kept relatively small due to the freezing process with nitrogen. Characteristics of these two coolants are described in table 3.1 and frozen ground after freezing process in the construction of U2 Schottenring station is shown in figure 3.8 (Martak and Herzfeld, 2005).



Figure 3.8 Frozen ground after freezing process in U2 Schottenring station

Table 3.1. Characteristics of the coolants used in freezing (Andersland, 2004)

Item	LN ₂	Brine
Site installation		
Electric power	not required	required
Water for cooling	not required	required
Refrigeration plant	not required	required
Storage tank	required	required
Circulation pumps	not required	required
Pipe system for distribution of coolant	supply only	supply and return
Low-temperature material for surface pipes, valves, etc.	not required	required
Excavation of freezing		
Physical condition of coolant	liquid / vapor	liquid
Minimum temperature achievable (theoretical)	-196 °C	-55 °C
Reuse of coolant	impracticable	standard
Control of system	difficult	easy
Shape of frozen wall	often regular	regular
Temperature profile in freeze wall	great differences	small differences
Frost penetration	fast	slow
Impact on freeze wall in case of damage to freeze pipe	none	thawing effect
Noise	none	little

3.4.3 Establishment of Freezing Pipes

Desired frozen bodies for ground freezing applications are created by pipes, in which the freezing liquid circulates. This circulation cools soil around the freezing pipes and water in soil turns into ice. Thereby, a frozen circle around the pipes is established. As the circulation of the liquid continues, frozen bodies around the pipes expand until they merge and form a frozen wall. The locations of the pipes are designed to create three different variations for the tunnels. These are roof, roof and

sides and closed ring (Figure 3.9). The existence of the frozen wall around the tunnel axis brings a temporary stability during the excavation (Andersland, 2004).

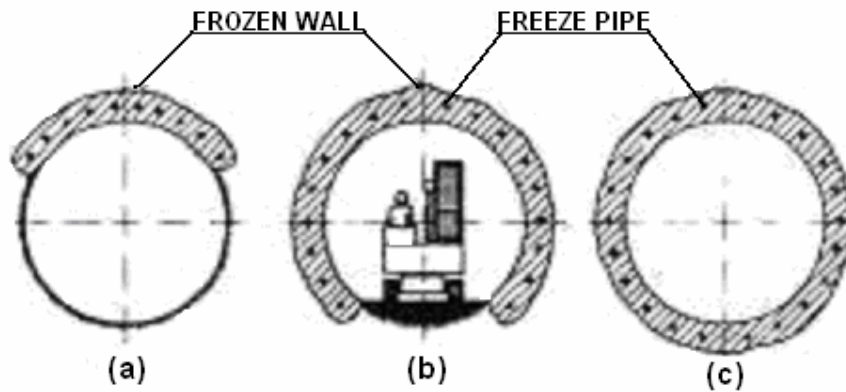


Figure 3.9 Design possibilities of the frozen walls around the tunnels: (a) roof, (b) roof and sides, (c) closed ring (Andersland, 2004)

In order to prevent the gaps in the frozen ring, the drilling direction is controlled with a boring gauge. Borings can be drilled up to 60 m in length accurately with the help of the gauge. Moreover, precise borings can be made up to 115 m with a steerable drilling bit (Figure 3.10) (Andersland, 2004).

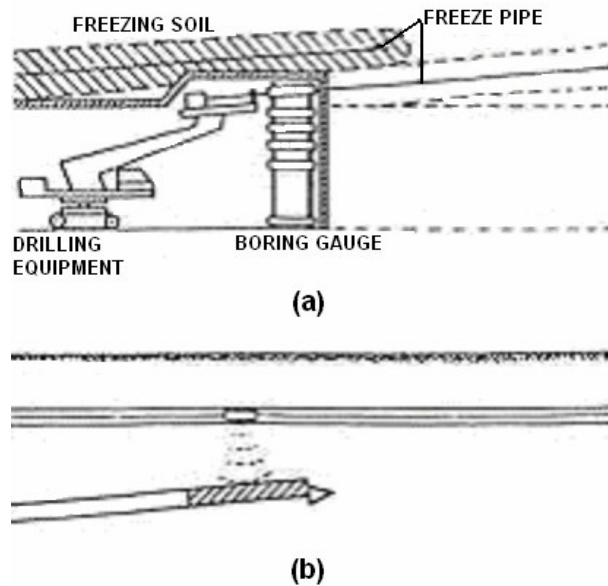


Figure 3.10 Installation of the freezing pipes; (a) with boring gauge, (b) with a steerable drilling bit (Andersland, 2004)

The under-crossing of Danube canal was planned as 40 m long circular frozen umbrella. Therefore, it was necessary to load the liquid Nitrogen from both sides. The freezing pipe holes were designed parallel to the tunnel axis. Their intervals change between 1.1 m and 1.4 m. 4 x 55 boreholes (30 boreholes for frozen ring with brine, 13 boreholes for frozen ring with liquid nitrogen, 4 discharge boreholes and 8 boreholes for temperature measurement for every tunnel driving) were drilled with a diameter of 139 mm. The pipes are shown in figure 3.11 (Martak and Herzfeld, 2005).



Figure 3.11 Freezing pipes

3.4.4 New Austrian Tunneling Method (NATM)

NATM is a tunneling method, which was developed between 1957 and 1965 in Austria. The concept of the method is to support the excavation with sprayed concrete linings until the permanent support is installed. The method was developed from the experience in tunneling in rocks. If tunnel supports are too stiff or installed too early, immoderately high loads are induced in the construction of tunnels in rock. Therefore, sprayed concrete with rock bolts as a primary support is safe and economic. Nevertheless, the use of the method in soft ground, which is defined in

tunneling concept as a type of ground requiring immediate support after excavation, demands more care especially in the urban areas. The stages of the method are as below;

- Initial support selection based on experience and empirical methods or numerical methods.
- The tunnel is sequentially excavated.
- The primary support is installed with sprayed concrete in combination with steel mesh, steel arches or ground reinforcement.
- Permanent support is installed.
- The excavated area is monitored and the design of the support system is revised if needed (Institute of Civil Engineers, 1997). Fenner-Pacher curves are generated in order to calculate the resistances of shotcrete, steel reinforcement and anchors/bolts. A typical Fenner-Pacher curve is shown in figure 3.12.

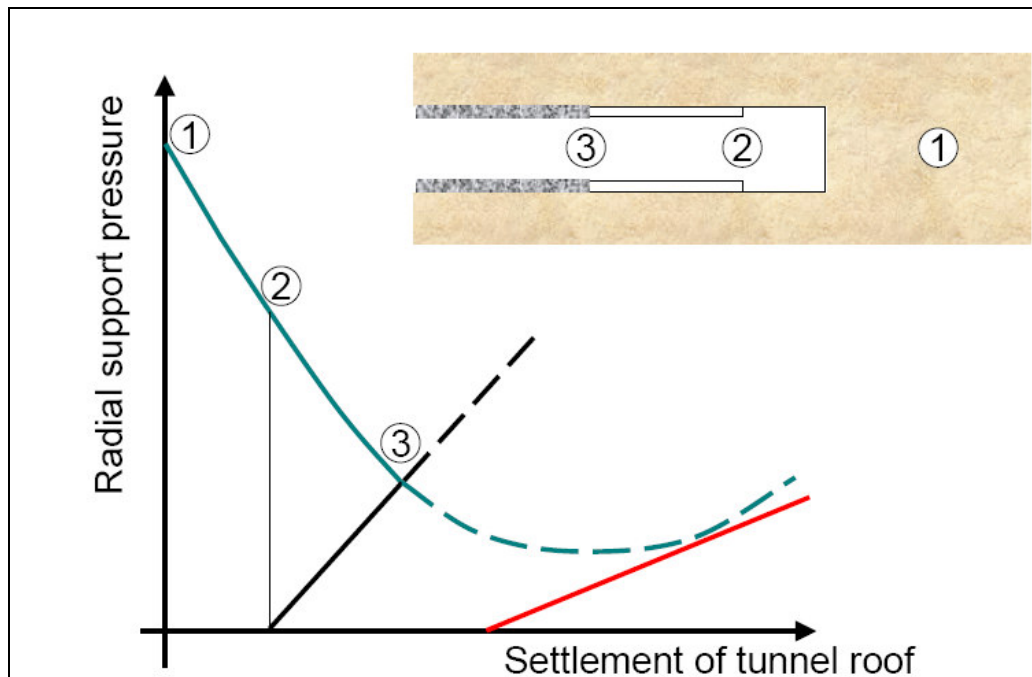


Figure 3.12 Typical Fenner-Pacher curve (Clayton, 2004)

The NATM was used in opening the tunnels of the station. Execution of sprayed concrete is shown in figure 3.13.



Figure 3.13 Execution of NATM in the construction of U2 Shottenring Station

4. VERTICAL DEFORMATIONS DUE TO FREEZING PROCESS

In this chapter, vertical deformations due to freezing process, which is called frost heave, are mentioned. These deformations must be taken into consideration for the design of artificial ground freezing applications. Two phenomena are effective on frost heave. These are; expansion resulting from the change of water phase and expansion due to water migration through the frozen fringe. Although these factors occur simultaneously, they do not affect the deformations equally. Volume change is approximately 9% after the conversion of water into ice. However, expansion as a result of water migration is much greater. Therefore, frost heave is mostly dependent on the movement of pore water during freezing process (Noon, 1996).

Soils, in which segregated ice forms under suitable conditions of moisture supply and temperature, are defined as frost-susceptible soils. If the water supply and temperature conditions continue, soil becomes ice-rich and this results frost heave (Everdingen, 2002). In table 4.1 a classification of the soils based on their frost susceptibility is shown. This classification system is developed by US Army Corps of Engineers in 1975, and is related to the Unified Soil Classification System (USCS). Soils are classified into groups and are put in order from non-frost susceptible to high frost susceptible.

Table 4.1 Frost-susceptibility classification of soils (US Army CE, 1984)

Frost susceptibility	Frost group	Type of soil	Amount finer than 0.02 mm	Typical soil type under unified soil classification system
Non-frost-susceptible	None	Gravels Sands	0-1.5 0-3	GW, GP, SW, SP
Possible		Gravels Sands	1.5-3 3-10	GW, GP, SW, SP
Very low to high	F1	Gravels	3-10	GW, GP, GW-GM, GP-GM
Medium to high	F2	Gravels	10-20	GM, GM-GC, GW-GM, GP-GM
Negligible to high		Sands	10-15	SW, SP, SM, SW-SM, SP-SM
Medium to high	F3	Gravels	>20	GM, GC
Low to high		Sands, except very fine silty sands	>15	SM, SC
Very low to very high		Clays, PI>12	–	CL, CH
Low to very high	F4	All silts	–	ML, MH
Very low to high		Very fine silty sands	>15	SM
Low to very high		Clays, PI<12	–	CL, CL-ML
Very low to very high		Varved clays and other fine-grained, banded sediments	–	CL and ML

4.1 Designed Course and Thickness of the Frozen Soil

The thickness of the frozen body in the range, where brine was applied, was planned to be 2 m and at the roof of the tunnel D1, the planned thickness of the frozen body was 3.5 m. Whereas, a thinner frozen body was enough for the roof of the D2 tunnel. The roof sides of the tunnels were frozen with LN_2 . These sections can be seen in cross-section of the construction site which is shown in figure 4.1. The application duration of the liquid Nitrogen was 15 days, which has a shocking freezing effect on soil with a temperature of -196°C . Moreover, brine freezing was applied for a period of 55 days (Martak and Herzfeld, 2005).

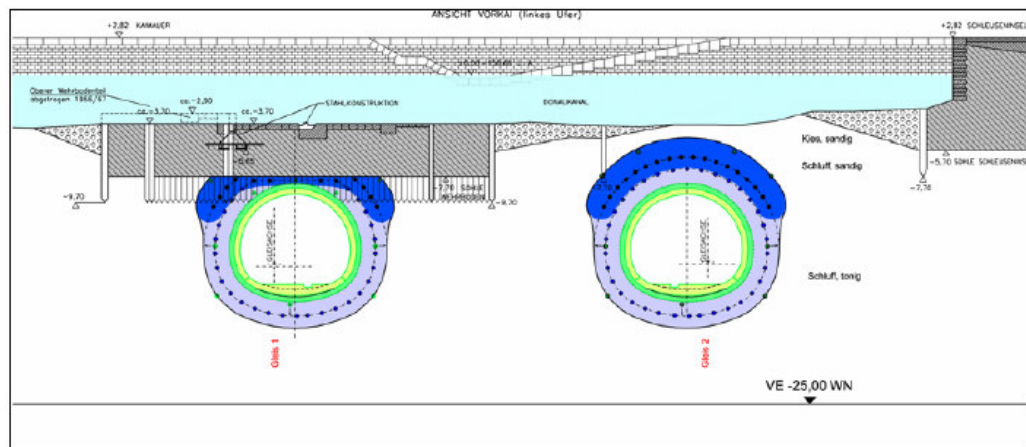


Figure 4.1 Cross-section of the construction site (bright blue region: frozen with brine, darker region: frozen with liquid Nitrogen) (Jöstl and Co., 2003)

4.2 Temperature Measurements

Control of the freezing process was achieved with temperature gauges which were installed parallel to the freezing pipes. These gauges supplied the information about the development of frozen body. After intended thickness was reached, further increase of the frozen soil was prevented and freezing liquid was used in order to keep soil frozen. Temperature-time graph for the tunnel D2 at 24 m away from the shafts is given in figure 4.2.

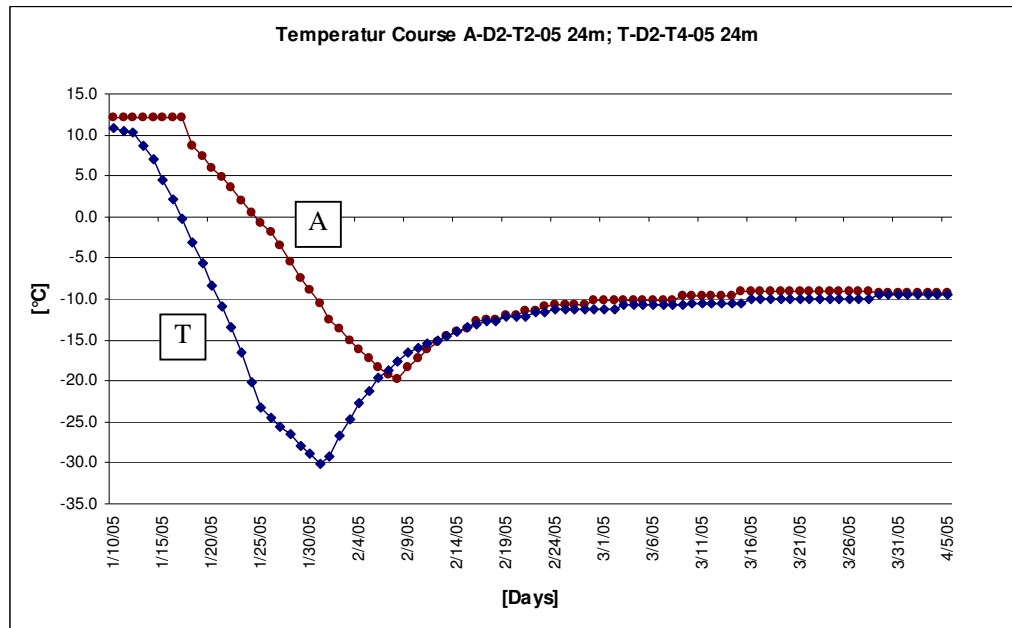


Figure 4.2 Temperature change with respect to time at D2 tunnel

4.3 Heaving Measurements

Topographic surveys were carried out during the freezing process. 62.1 mm heave was observed above shaft A, whereas the highest frost heave measurement at shaft T was 28.9 mm (See figure 3.1 for shaft locations.). Heave – time graphs are shown in figures 4.3 and 4.4.

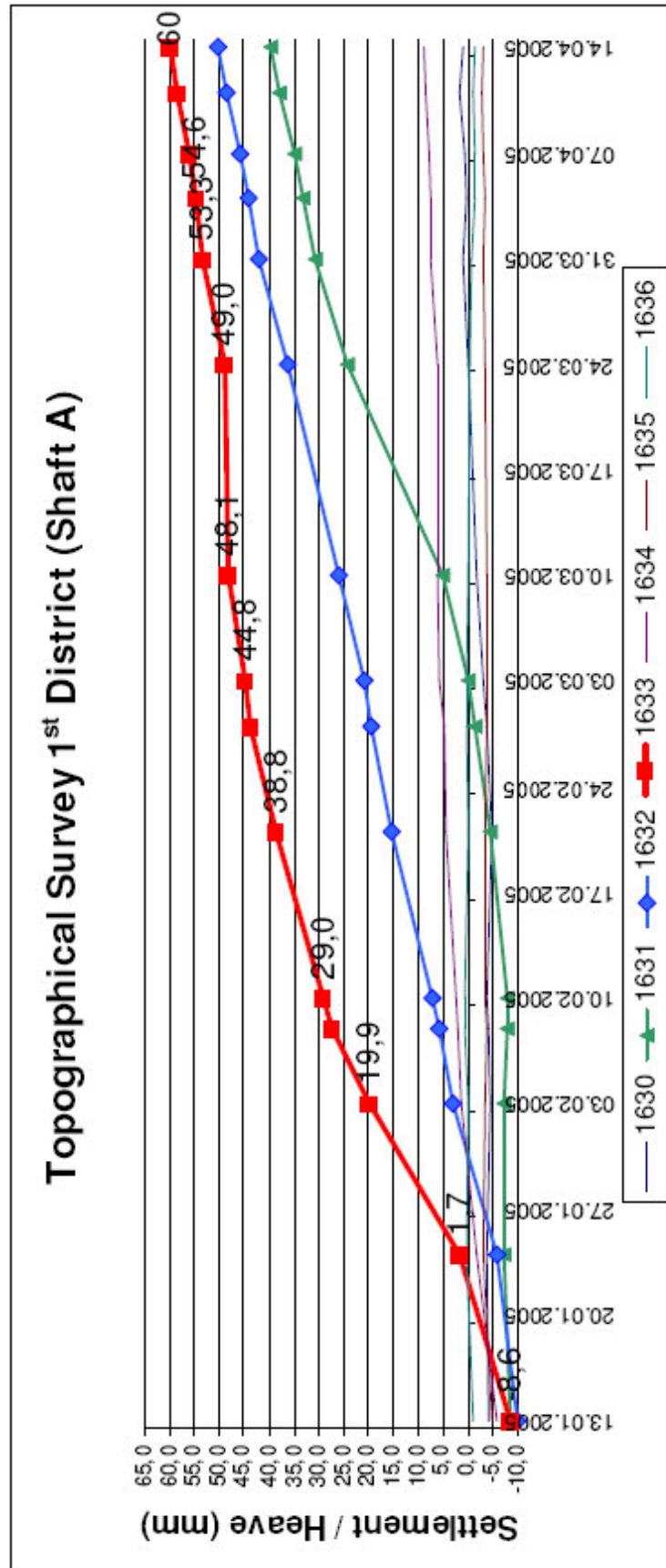


Figure 4.3 Heave measurements at Shaft A (ISP GMBH, 2005)

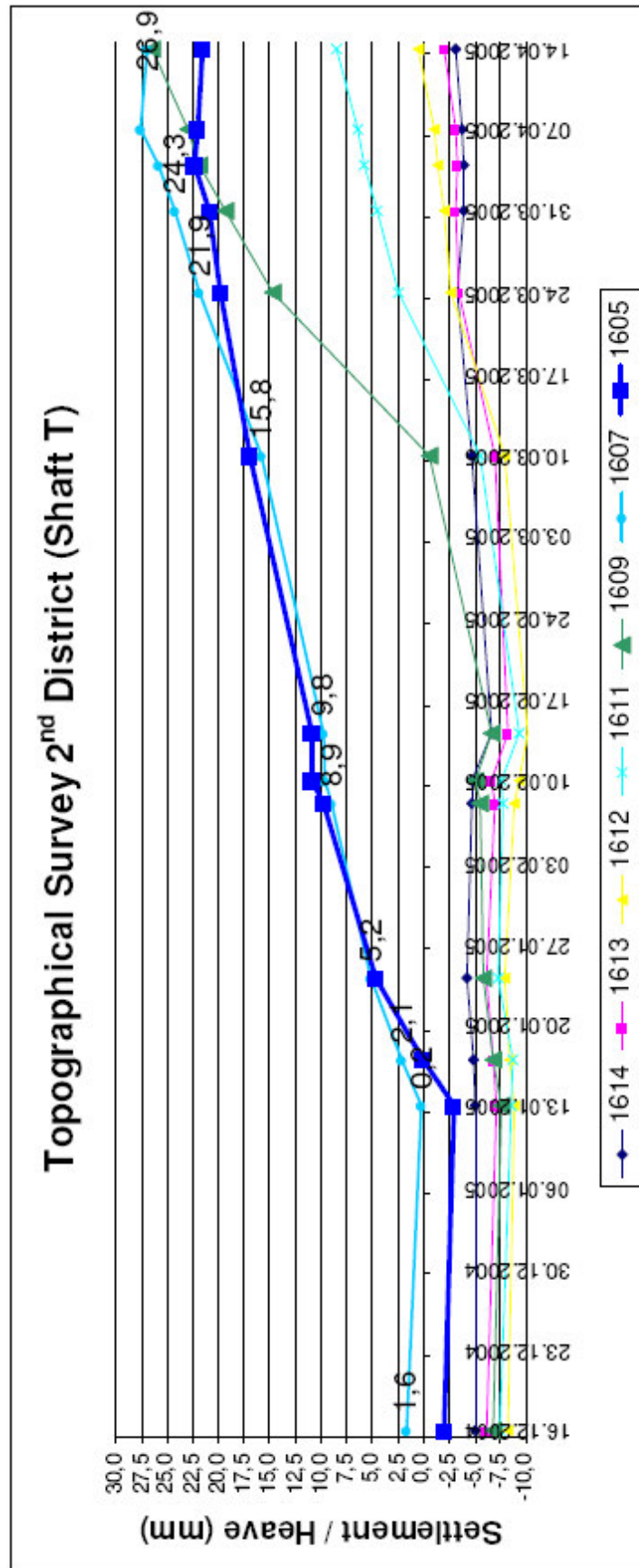


Figure 4.4 Heave measurements at Shaft T (ISP GMBH, 2005)

4.4 Estimation of Ice Thickness

As mentioned above, temperature measurements were made along the tunnel axis during the freezing process. Temperature – distance graphics were drawn for the points at shaft A and shaft T where heave measurements were made. Mentioned distances are the distances between temperature gauges and freezing pipes. An average line is drawn among the points and is assumed that the distance on this average line at temperature 0 °C is half of the ice thickness. Temperature – distance graph of shaft A on 03.02.2005 is shown in figure 4.5. All results are shown in appendix A. Data is shown in appendix C and locations of the temperature gauges are shown in appendix B.

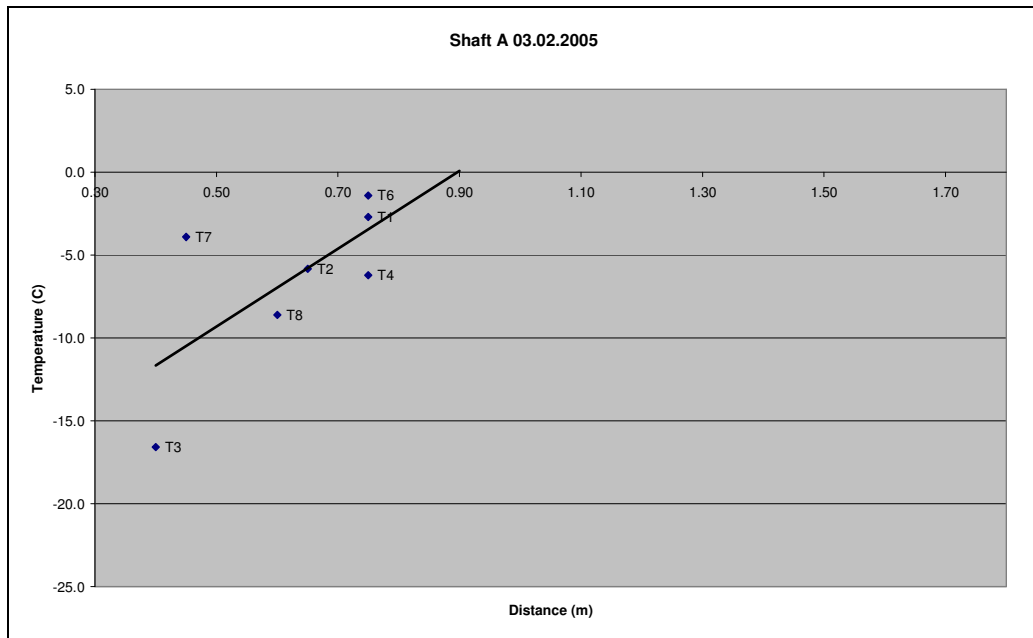


Figure 4.5 Temperature – distance graph of Shaft A on 03.02.2005

Results of this estimation are shown on ice thickness – time graph (figure 4.6). It is seen on the graph that ice thickness at shaft A is bigger than the ice thickness at shaft T. As shown in figure 4.2, shaft T was cooler than shaft A during freezing process, which produced thicker ice body around tunnel axis at shaft A and higher elevations above shaft A.

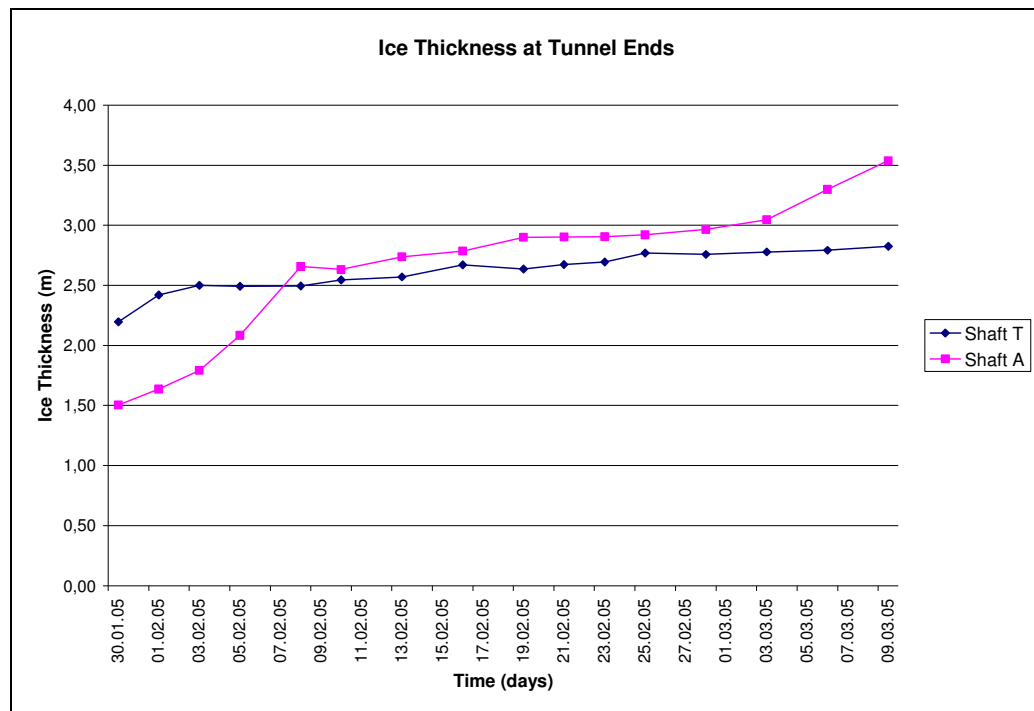


Figure 4.6 Ice thickness – time graph

5. CONCLUSION

Frozen ground engineering has been used for more than a century. The areas this knowledge is used; are natural problems of permafrost regions, where the temperature of the ground is below 0 °C seasonally, continuously for at least consecutive years, and constructional applications, where soil is artificially frozen. In both areas, a common problem is deformations due to frost heave (Everdingen, 2002).

In order to comprehend the problem, frozen soil was examined in chapter 2. Freezing process is explained and is told that the major reason of frost heave is the migration of the water to frozen fringe. Moreover, general properties and mechanical properties of the frozen soil are given in this chapter.

In chapter 3, a case history of an artificial ground freezing application is told. The reasons, that let the designers to use this special method, were explained. Furthermore, geology of the region and construction site is mentioned. Then construction process is examined.

Finally, the frost heave phenomenon is explained briefly in chapter 4. Soils are classified and shown in a table according to their frost susceptibilities. This property of soils is significant for the deformations due to frost heave. Moreover, temperature and ground elevation measurements are mentioned and an analysis based on these measurements is made. Discussions are made on the measurements and this analysis below.

It is observed that at Shaft A (1st District Schleuseninsel), the maximum heaving is 62.1 mm (25.04.2005) whereas at Shaft T (2nd District Kaimauer) it is 29.9 mm (25.04.2005). Moreover, the coldest temperature at shaft T is lower than the coldest temperature at shaft A. This shows that frost heave deformation is less when the frost penetration is at a smaller rate.

Furthermore, estimations of ice thickness along the tunnel axis is made for the days when the heave measurements were carried out in order to investigate a correspondence between frost heave and ice thickness. The results are shown in table 5.1. This investigation was made by finding ratios between heave deformations and average ice thickness. However, a relevant correlation could not be found.

Table 5.1 Summary of heave measurements and ice thickness estimation

Date	1 st District Shaft A			2 nd District Shaft T		
	Frost Heave (a)	Av. Ice Thickness (b)	$\frac{a}{b}$ (%)	Frost Heave (a)	Av. Ice Thickness (b)	$\frac{a}{b}$ (%)
03.02.2005	19.9 mm	1.8 m	1.11			
08.02.2005	27.2 mm	2.6 m	1.05	9.8 mm	2.5 m	0.39
10.02.2005	29.0 mm	2.6 m	1.12	10.8 mm	2.6 m	0.42
14.02.2005				10.9 mm	2.6 m	0.42
21.02.2005	38.8 mm	2.8 m	1.39			
28.02.2005	43.8 mm	3.0 m	1.46			
03.03.2005	44.8 mm	3.0 m	1.49			
10.03.2005				17.0 mm	3.2 m	0.53
24.03.2005				19.8 mm	3.0 m	0.66
31.03.2005				20.9 mm	3.4 m	0.61

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<http://www.wien.gv.at>

<http://www.tiscover.at>

APPENDICES

A. ANALYSIS FOR ESTIMATING THE ICE THICKNESS

Analysis, which were made in order to estimate the ice thickness are shown below.

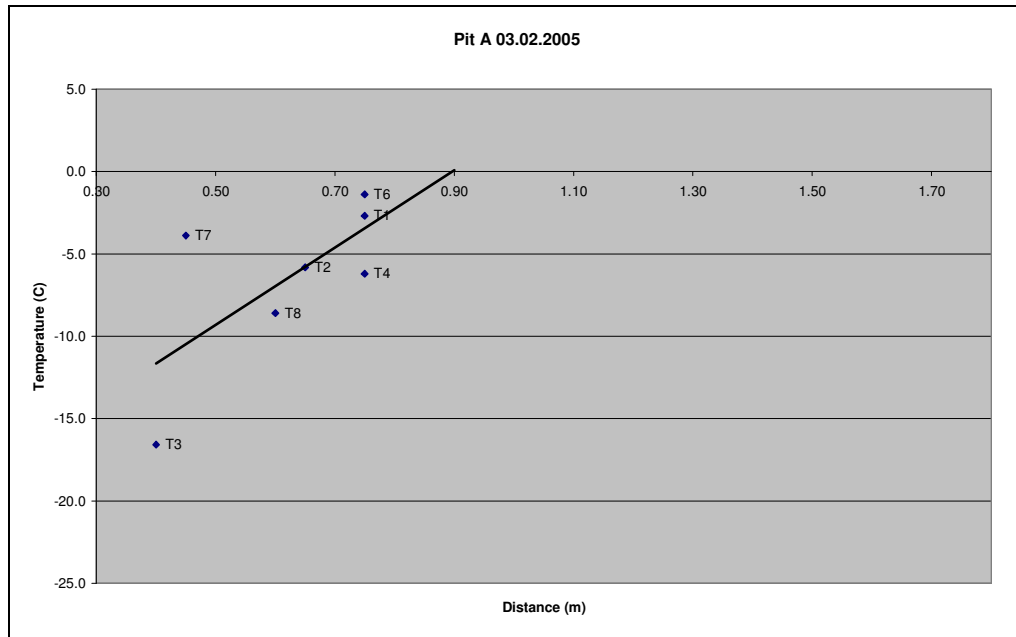


Figure A.1 03.02.2005, 1st District Pit A, average ice thickness = $0,9 \times 2 = 1,8$ m

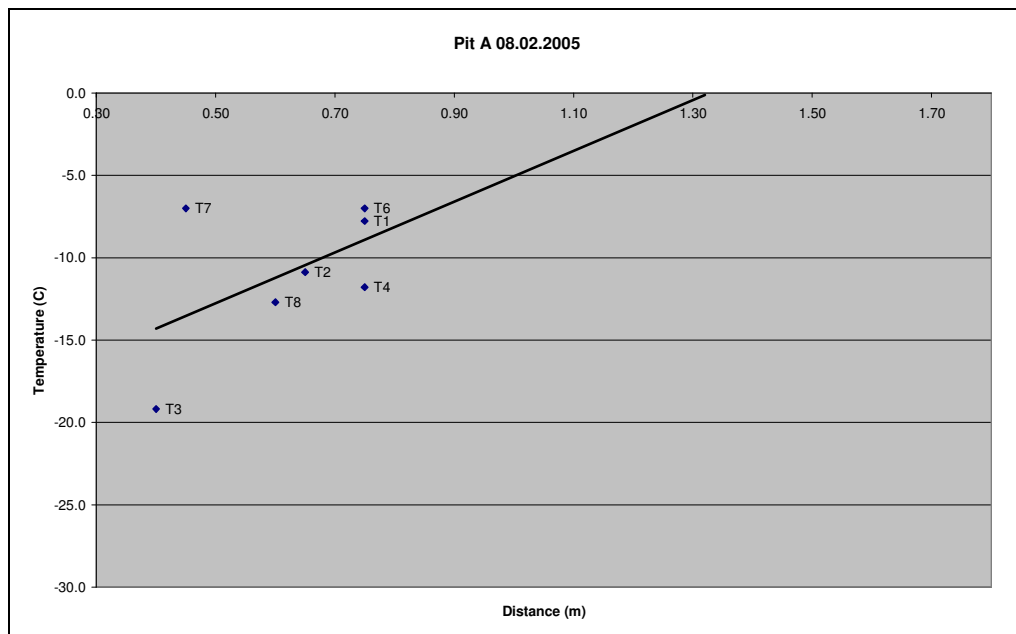


Figure A.2 08.02.2005, 1st District Pit A, average ice thickness = $1,3 \times 2 = 2,6$ m

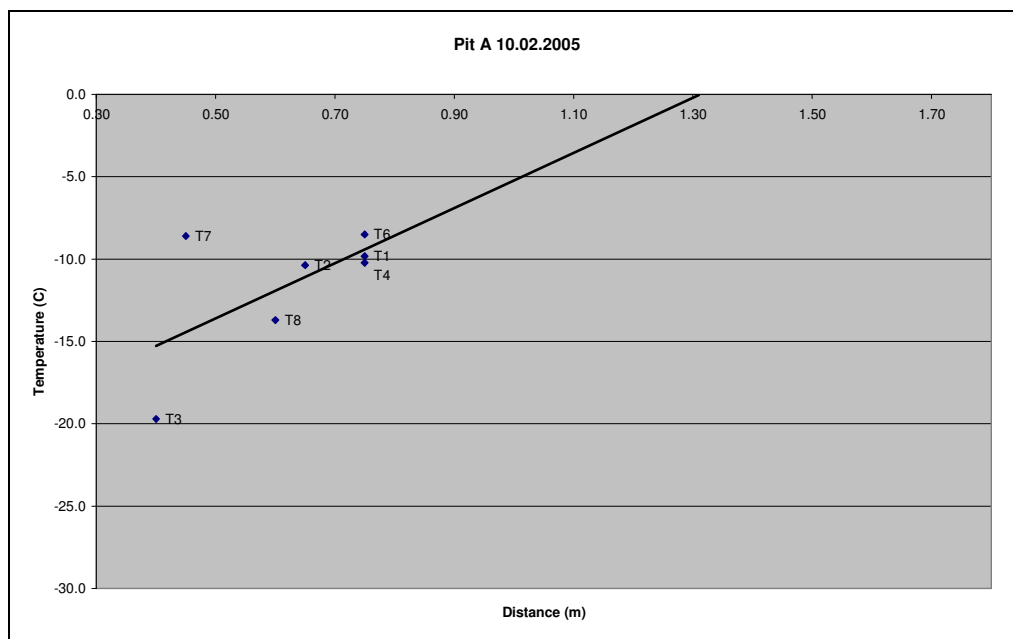


Figure A.3 10.02.2005, 1st District Pit A, average ice thickness = $1,3 \times 2 = 2,6$ m

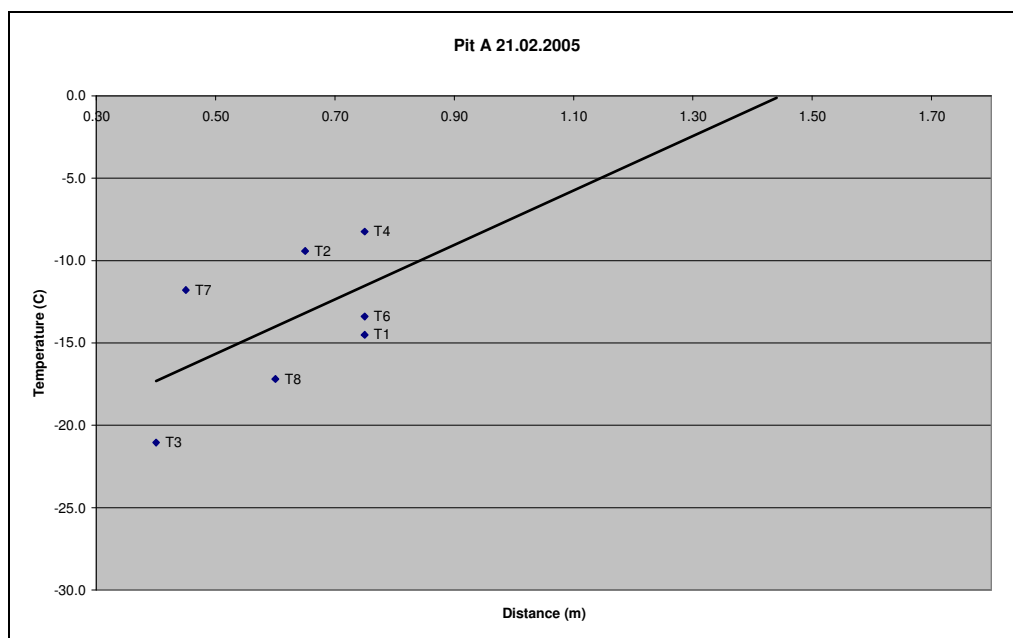


Figure A.4 21.02.2005, 1st District Pit A, average ice thickness = $1,4 \times 2 = 2,8$ m

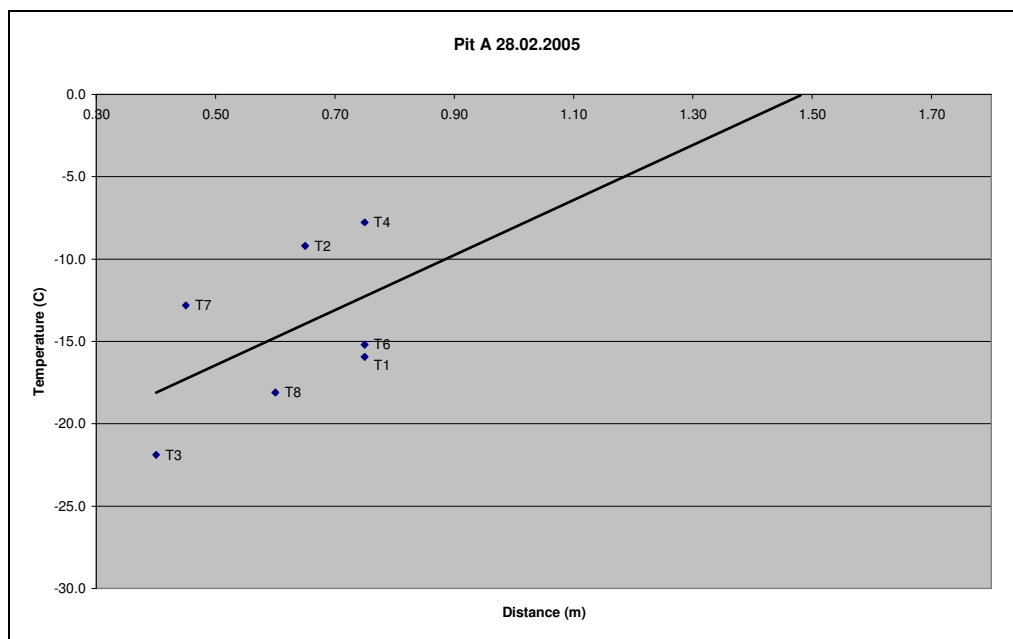


Figure A.5 28.02.2005, 1st District Pit A, average ice thickness = $1,5 \times 2 = 3,0$ m

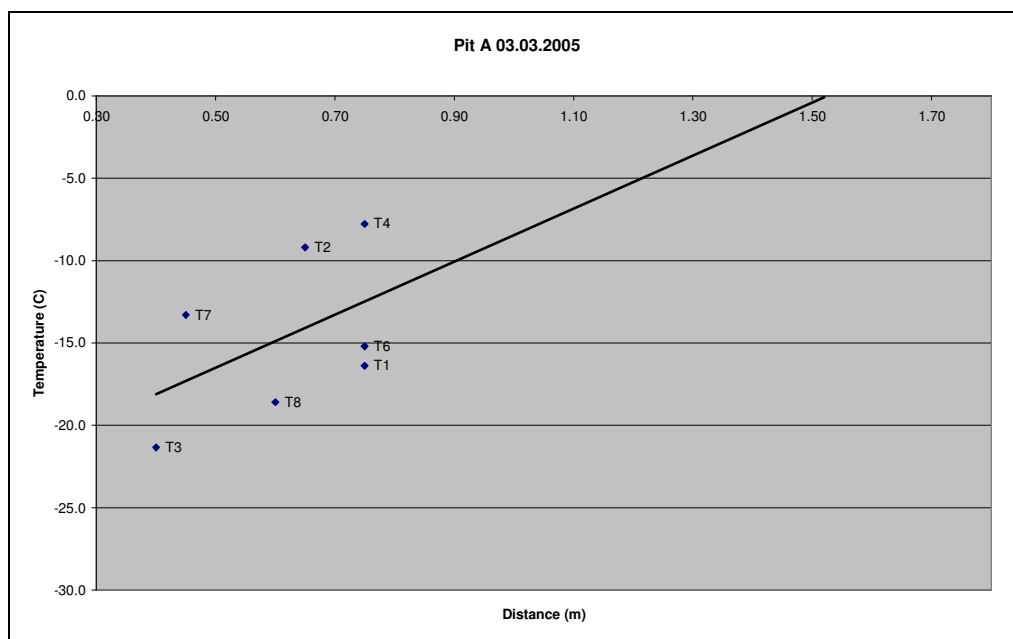


Figure A.6 03.03.2005, 1st District Pit A, average ice thickness = $1,5 \times 2 = 3,0$ m

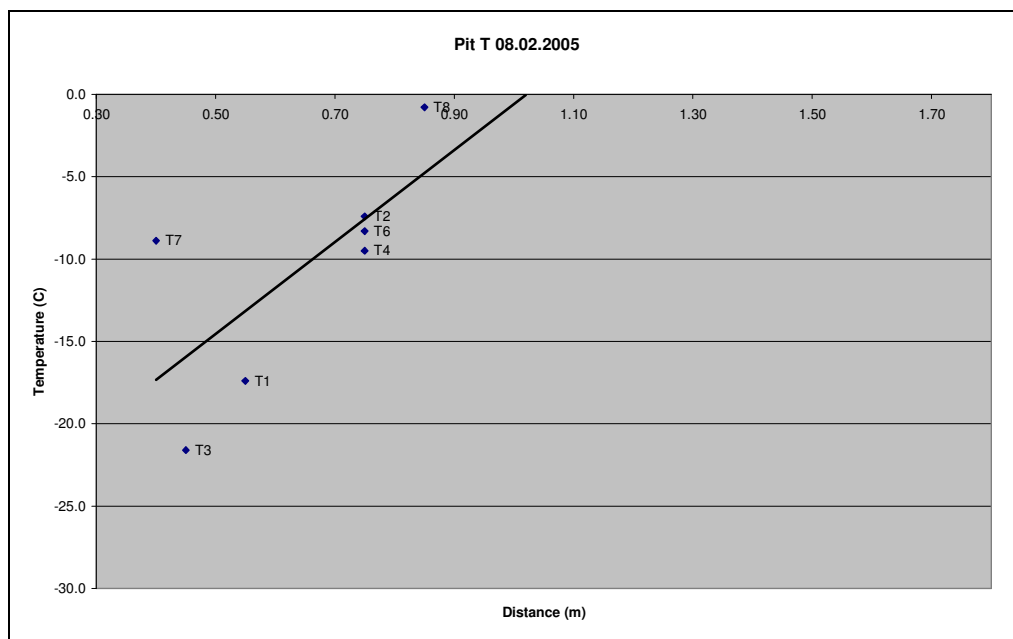


Figure A.7 08.02.2005, 2nd District Pit T, average ice thickness = $1,0 \times 2 = 2,0$ m

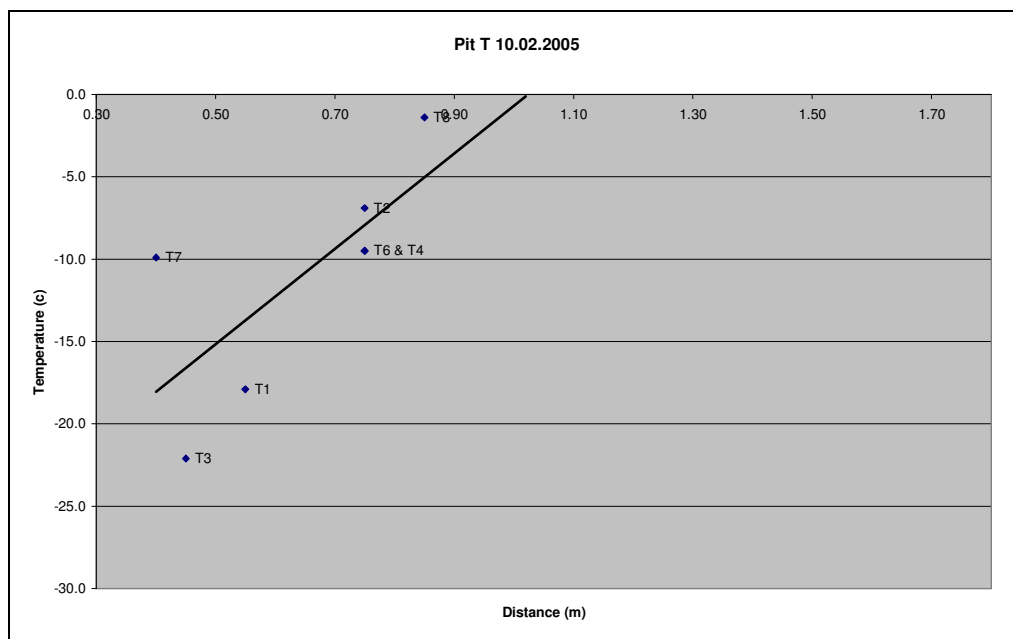


Figure A.8 10.02.2005, 2nd District Pit T, average ice thickness = $1,0 \times 2 = 2,0$ m

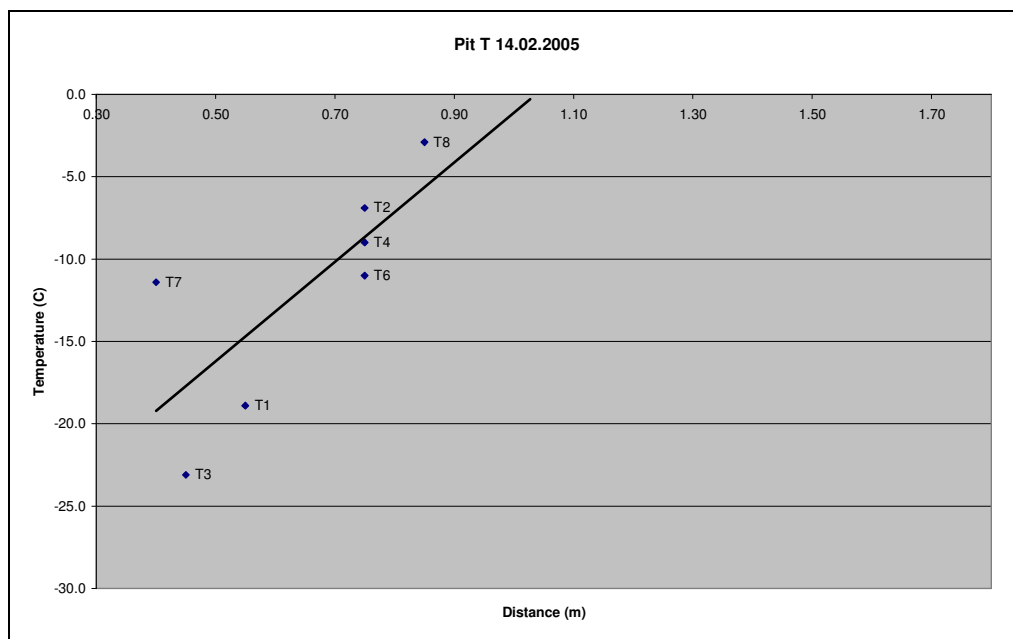


Figure A.9 14.02.2005, 2nd District Pit T, average ice thickness = $1,0 \times 2 = 2,0$ m

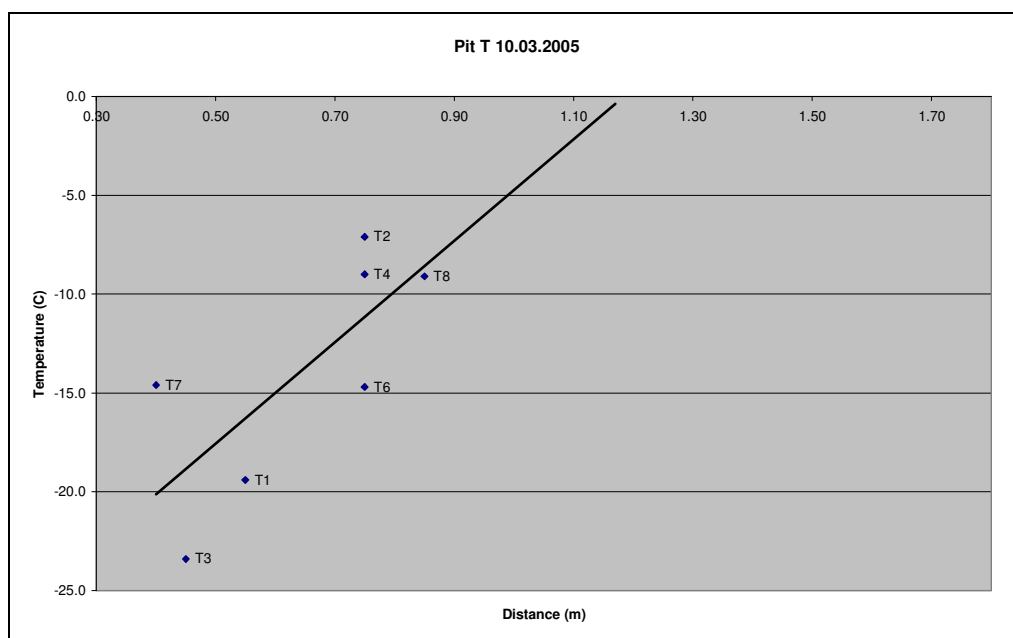


Figure A.10 10.03.2005, 2nd District Pit T, average ice thickness = $1,2 \times 2 = 2,4$ m

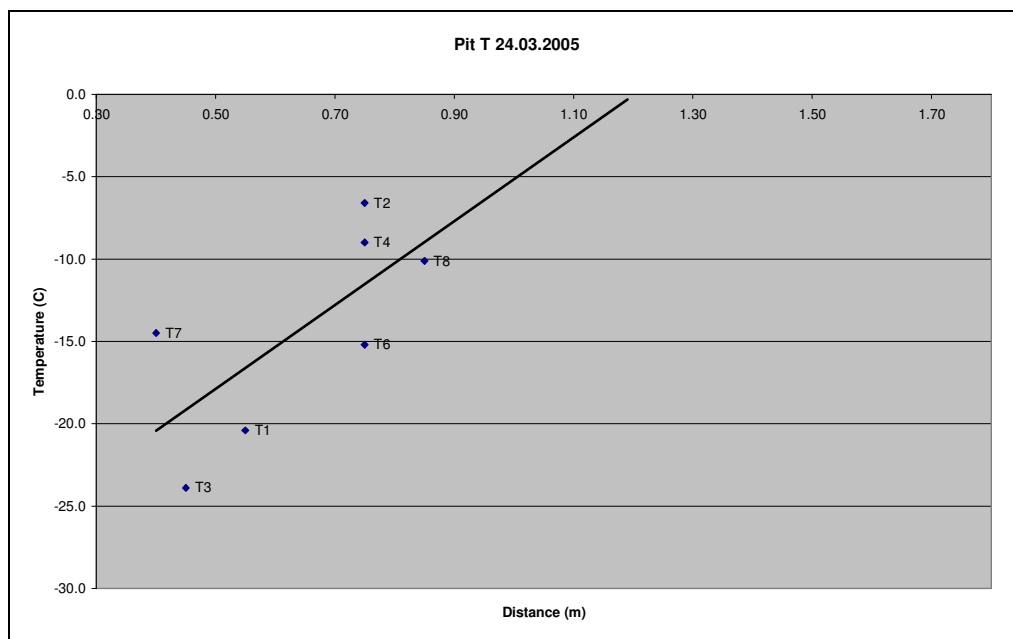


Figure A.11 24.03.2005, 2nd District Pit T, average ice thickness = $1,2 \times 2 = 2,4$ m

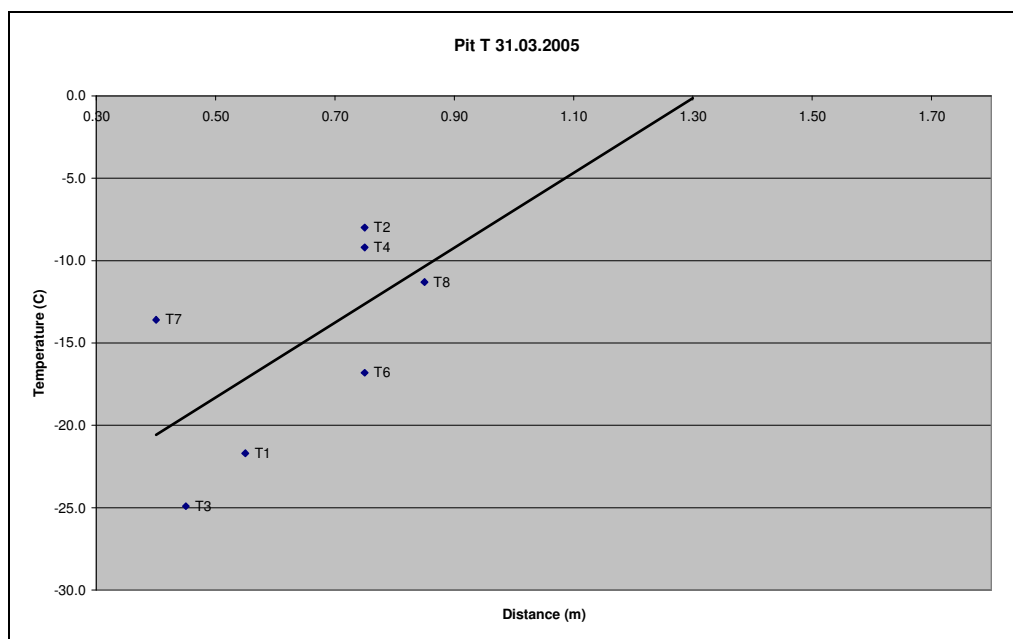


Figure A.12 31.03.2005, 2nd District Pit T, average ice thickness = $1,3 \times 2 = 2,6$ m

B. LOCATIONS OF THE TEMPERATURE GAUGES

In the pictures below, locations of temperature gauges at each tunnel end is shown. Dots denoted with “T” are the positions of the pipes, which consist temperature gauges inside.

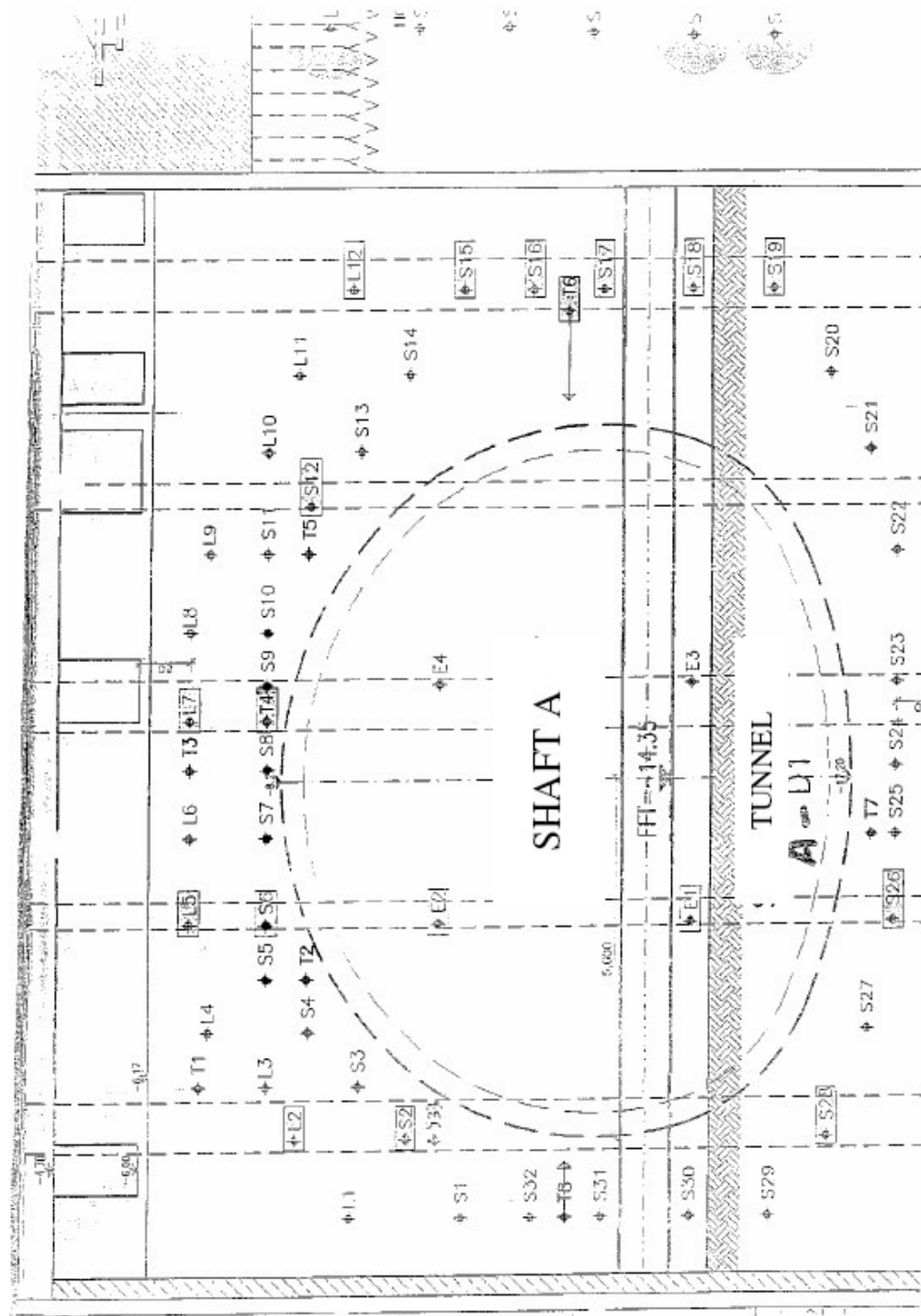


Figure B.1 Cross-section of D1 tunnel at Shaft A

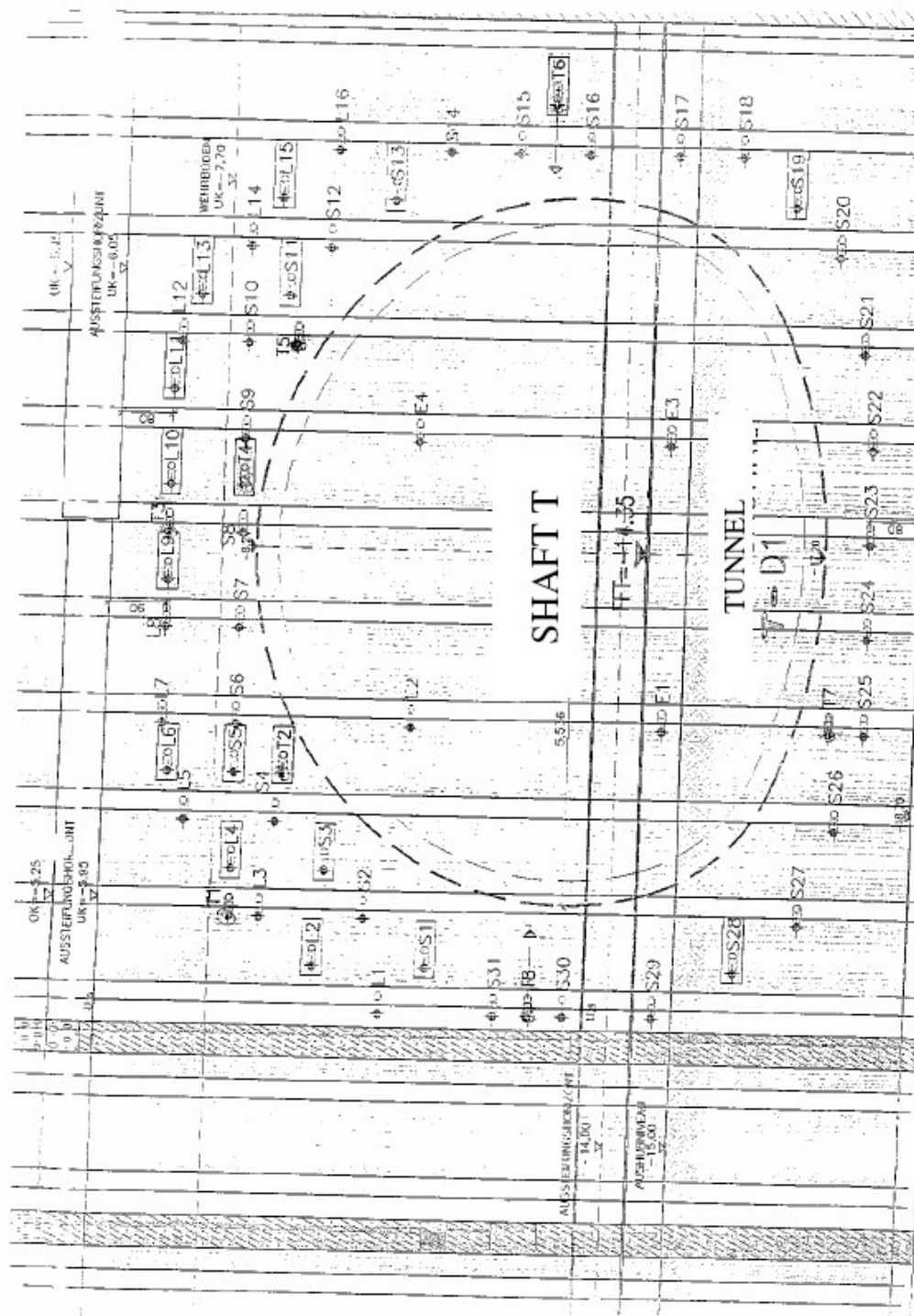


Figure B.2 Cross-section of D1 tunnel at Shaft T

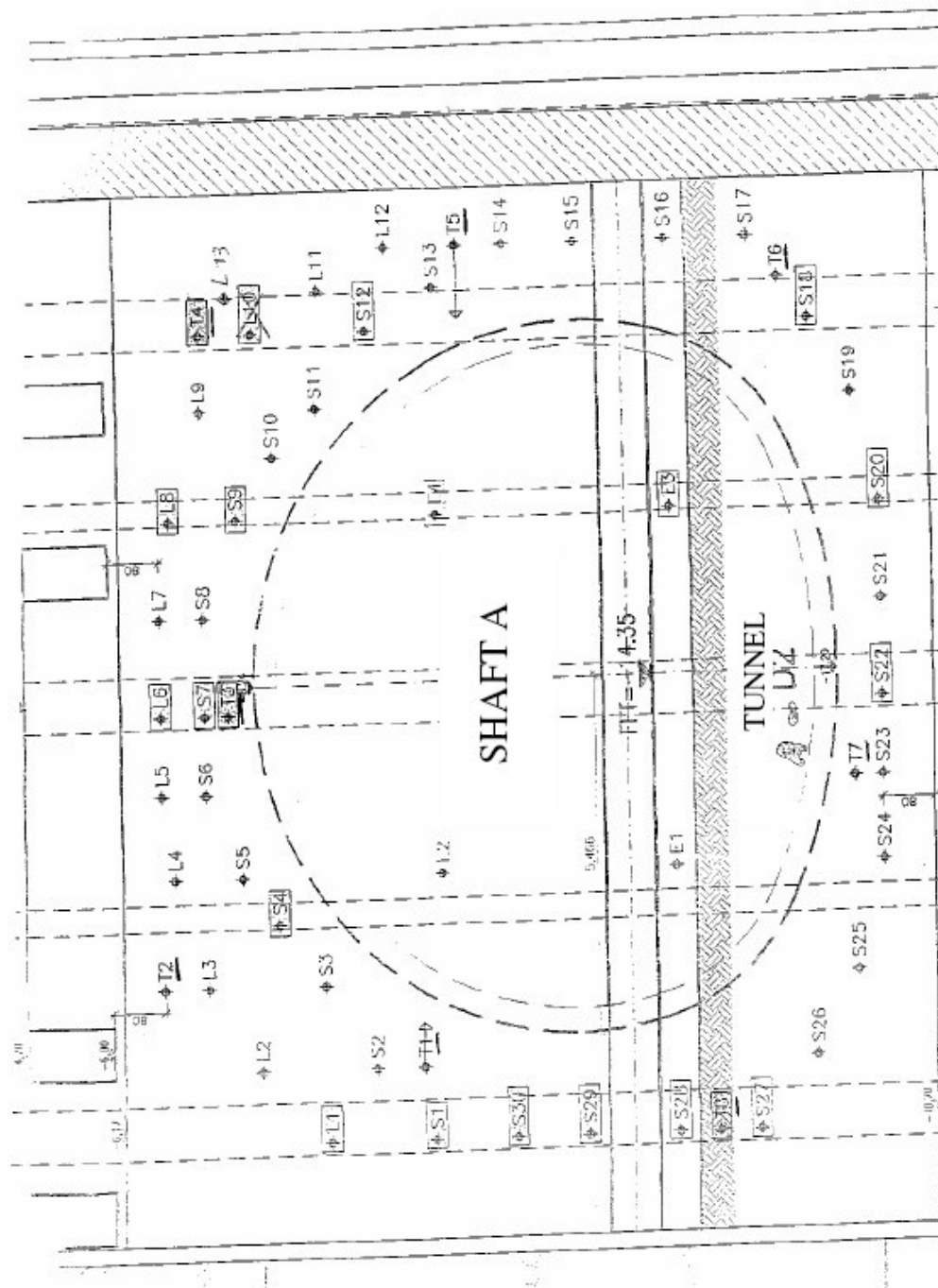


Figure B.3 Cross-section of D2 tunnel at Shaft A

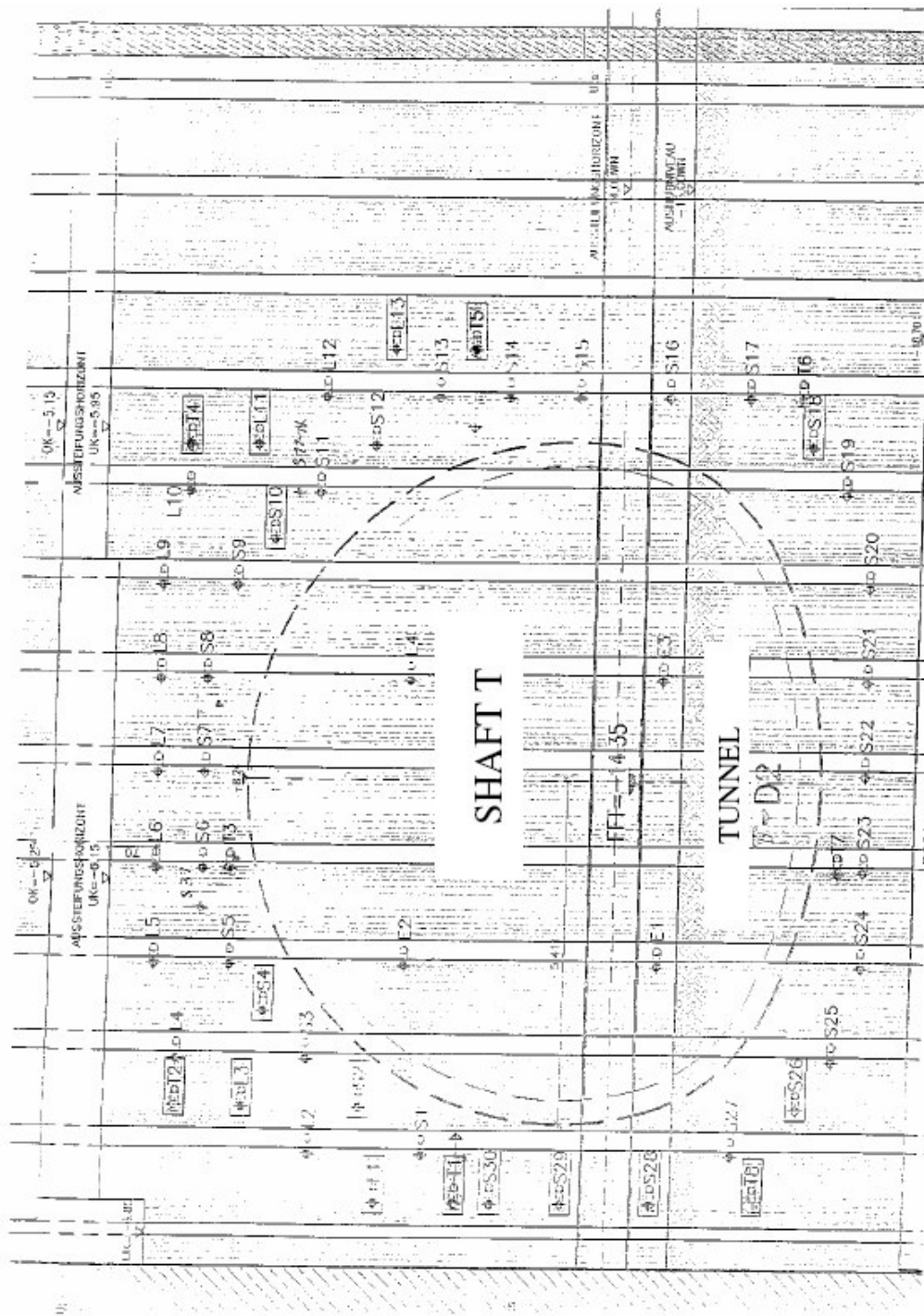


Figure B.4 Cross-section of D2 tunnel at Shaft T

C. TEMPERATURE MEASUREMENTS

The data collected from the temperature gauges along the tunnel axis is shown in the tables below.

Table C.1 Temperature measurements of Gauge T1 at Shaft A and Gauge T5 at Shaft T																					
		10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
		A-D2-T1-10	A-D2-T1-09	A-D2-T1-08	A-D2-T1-07	A-D2-T1-06	A-D2-T1-05	A-D2-T1-04	A-D2-T1-03	A-D2-T1-02	A-D2-T1-01	T-D2-T5-01	T-D2-T5-02	T-D2-T5-03	T-D2-T5-04	T-D2-T5-05	T-D2-T5-06	T-D2-T5-07	T-D2-T5-08	T-D2-T5-09	T-D2-T5-10
		0.75	0.75	0.75	0.75	0.73	0.70	0.69	0.67	0.65	0.50	0.32	0.40	0.48	0.57	0.65	0.68	0.70	0.78	0.86	0.95
10/01/2005		11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	11.0	11.1	10.9	11.0	11.5	11.2	11.7	12.2	13.0	12.7
11/01/2005		11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.7	10.8	10.9	11.1	11.4	11.2	11.7	12.1	12.7	12.4
12/01/2005		11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	9.5	9.3	9.6	10.0	10.3	10.1	10.6	11.1	11.9	11.8
13/01/2005		11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	8.1	7.8	8.3	8.8	9.1	9.1	9.4	10.0	10.9	10.9
14/01/2005		11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	6.8	6.4	7.0	7.7	7.8	8.1	8.2	8.9	9.8	10.0
15/01/2005		11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	5.3	5.0	5.7	6.4	6.5	6.9	6.8	7.7	8.7	8.8
16/01/2005		11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	3.9	3.5	4.4	5.1	5.2	5.7	5.7	6.6	7.6	7.7
17/01/2005		11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	2.4	2.1	3.2	3.9	4.1	4.5	4.4	5.6	6.6	6.7
18/01/2005		5.9	6.9?		6.2	5.8	5.8	5.4	4.9	-1.6	0.0	0.9	0.9	1.8	2.6	2.5	3.0	3.2	3.9	4.9	5.4
19/01/2005		5.1	6.0?		5.0	4.7	4.6	4.5	3.9	-5.3	-0.8	0.4	0.0	0.9	1.6	1.7	2.0	2.3	3.0	4.0	4.7
20/01/2005		4.6	4.9?		4.5	4.2	4.1	4.0	3.4	-8.3	-5.5	-0.1	-0.5	0.4	1.7	1.7	1.5	1.8	2.5	3.5	4.1
21/01/2005		3.7	4.5?		3.7	3.4	3.3	3.2	2.6	-10.5	-9.5	-0.8	-1.2	-0.3	0.2	0.3	0.7	0.9	1.6	2.6	3.3
22/01/2005		3.0	3.5?		3.0	3.0	2.9	2.8	1.8	-12.6	-12.6	-2.0	-3.0	-1.6	-0.1	0.0	0.4	0.7	1.1	2.1	2.8
23/01/2005		2.3	3.0?		2.6	2.4	2.3	2.1	1.2	-14.7	-17.4	-5.9	-2.9	-0.3	-0.2	0.2	0.4	0.6	1.6	2.2	2.2
24/01/2005		1.9	2.5?		2.1	1.9	1.9	1.7	0.8	-17.7	-20.2	-8.0	-9.0	-4.9	-1.8	-1.8	-0.3	-0.1	0.6	1.0	1.7
25/01/2005		1.8	2.4?		2.0	1.7	1.7	1.5	0.7	-19.9	-21.7	-9.9	-11.9	-7.3	-3.4	-3.4	-0.4	-0.3	0.1	0.7	1.4
26/01/2005		1.5	2.0?		1.7	1.4	1.4	1.2	0.5	-21.1	-23.5	-12.3	-13.2	-9.3	-5.8	-5.3	-1.7	-0.4	-0.1	0.4	0.7
27/01/2005		1.0	1.5?		1.2	1.9	0.9	0.7	0.0	-22.7	-24.6	-14.8	-16.3	-11.4	-8.4	-8.5	-4.8	-3.4	-1.1	-0.1	0.7
28/01/2005		0.4	1.0?		0.7	0.4	0.4	0.2	-0.5	-24.3	-26.1	-16.4	-17.9	-13.4	-10.4	-10.7	-7.5	-5.4	-3.2	-1.1	0.2
29/01/2005		0.4	0.8?		0.6	0.4	-0.1	-0.2	-0.8	-26.5	-28.4	-18.3	-19.8	-15.5	-12.8	-12.8	-9.7	-7.4	-5.1	-2.9	-1.7
30/01/2005		-0.1	0.3?		0.1	-0.1	-0.4	-0.7	-1.8	-28.1	-29.9	-20.2	-21.6	-17.6	-15.3	-14.8	-11.8	-9.5	-7.0	-4.6	-3.2
31/01/2005		-0.6	-0.2?		-0.4	-1.1	-1.4	-1.7	-2.9	-29.7	-31.7	-22.3	-23.8	-20.0	-18.1	-16.9	-14.0	-12.0	-9.3	-6.8	-4.9
01/02/2005		-1.2	-0.3?		-1.4	-1.9	-2.0	-2.6	-3.7	-30.4	-32.4	-23.6	-25.2	-21.5	-20.1	-19.1	-15.6	-13.4	-10.6	-8.2	-6.2
02/02/2005		-1.7	-0.8?		-1.9	-2.4	-3.0	-3.1	-4.7	-29.9	-32.4	-24.6	-26.2	-22.5	-21.2	-20.2	-17.1	-14.5	-12.2	-9.7	-7.7
03/02/2005		-2.7	-1.8?		-2.9	-3.4	-3.5	-4.1	-5.7	-29.9	-31.9	-24.6	-26.2	-23.0	-21.7	-20.7	-17.6	-15.5	-12.7	-10.3	-8.7
04/02/2005		-3.7	-2.8?		-3.4	-4.4	-4.6	-5.2	-6.7	-29.4	-31.9	-24.6	-26.7	-23.5	-21.7	-20.7	-18.2	-15.5	-13.2	-11.3	-9.3
05/02/2005		-4.7	-3.8?		-4.4	-4.9	-5.6	-6.2	-7.8	-29.4	-31.4	-24.6	-26.7	-23.5	-21.7	-20.7	-18.2	-16.0	-13.7	-11.8	-9.8
06/02/2005		-5.7	-4.8?		-5.4	-6.0	-6.6	-7.7	-9.3	-29.4	-31.4	-25.2	-26.7	-23.5	-21.7	-20.6	-18.7	-16.5	-14.2	-12.3	-10.3
07/02/2005		-6.8	-5.9?		-6.4	-7.0	-7.1	-7.7	-9.3	-29.4	-31.4	-25.2	-27.2	-23.5	-21.7	-20.9	-18.7	-16.5	-14.7	-12.8	-10.8
08/02/2005		-7.8	-6.9?		-7.4	-8.0	-8.1	-8.7	-10.3	-29.9	-31.4	-25.2	-27.2	-23.5	-21.7	-20.8	-18.7	-17.0	-15.2	-12.8	-11.8

09/02/2005	-8.8	-7.9?	-8.5	-8.5	-9.1	-9.7	-11.3	-29.9	-30.9	-25.7	-27.7	-23.5	-21.7	-20.8	-18.7	-17.0	-15.7	-13.4	-11.8
10/02/2005	-9.8	-8.9?	-9.5	-9.6	-10.1	-10.2	-12.3	-29.9	-30.9	-25.7	-27.7	-23.5	-21.7	-21.1	-19.2	-17.5	-15.7	-13.9	-12.3
11/02/2005	-10.8	-9.4?	-10.0	-10.6	-10.6	-11.2	-12.8	-29.9	-30.9	-26.2	-27.7	-24.0	-21.7	-20.7	-19.2	-18.0	-16.2	-13.9	-12.8
12/02/2005	-11.3	-10.5?	-10.5	-11.1	-11.1	-11.7	-13.3	-29.9	-30.9	-26.2	-28.2	-24.0	-21.7	-21.3	-19.7	-18.0	-16.7	-14.4	-13.4
13/02/2005	-12.3	-11.0?	-11.3	-11.6	-11.8	-12.3	-14.0	-30.4	-30.9	-26.7	-28.8	-24.6	-22.2	-21.3	-19.7	-18.5	-16.7	-14.9	-13.9
14/02/2005	-12.8	-11.5?	-11.8	-12.1	-12.3	-12.8	-14.5	-30.4	-30.9	-26.7	-28.8	-24.6	-22.2	-21.5	-20.2	-18.5	-17.2	-15.4	-13.9
15/02/2005	-13.0	-12.1?	-12.2	-12.7	-12.8	-13.1	-14.9	-30.3	-30.9	-26.8	-28.8	-24.7	-22.3	-22.4	-20.3	-18.8	-17.4	-15.7	-14.2
16/02/2005	-13.8	-12.6?	-12.8	-13.1	-13.2	-13.6	-15.2	-30.2	-30.8	-26.9	-28.8	-24.8	-22.4	-22.3	-20.4	-19.2	-17.7	-15.9	-14.4
17/02/2005	-14.0	-12.8?	-13.0	-13.3	-13.4	-13.8	-15.4	-30.1	-30.9	-27.2	-29.0	-25.0	-22.4	-21.8	-20.5	-19.4	-17.9	-16.2	-14.8
18/02/2005	-14.0	-12.8?	-13.0	-13.3	-13.4	-13.8	-15.4	-30.1	-30.9	-27.2	-28.9	-24.9	-22.5	-21.7	-20.5	-19.4	-18.0	-16.2	-14.8
19/02/2005	-14.5	-13.4?	-13.0	-13.3	-13.4	-13.8	-15.4	-30.1	-30.9	-27.2	-28.9	-24.9	-22.5	-21.8	-20.5	-19.4	-18.0	-16.7	-15.3
20/02/2005	-14.5	-13.4?	-13.5	-13.8	-13.9	-14.3	-15.4	-29.6	-30.9	-27.2	-28.9	-24.9	-22.5	-22.0	-21.0	-19.9	-18.5	-16.7	-15.3
21/02/2005	-14.5	-13.4?	-13.5	-13.8	-13.9	-14.3	-15.9	-29.6	-30.9	-27.2	-28.9	-24.9	-22.5	-22.3	-21.0	-19.9	-18.5	-16.7	-15.8
22/02/2005	-15.0	-13.9?	-13.5	-13.8	-14.5	-14.3	-15.9	-29.6	-30.9	-27.2	-28.9	-24.9	-22.5	-22.3	-21.0	-19.9	-19.0	-17.2	-15.8
23/02/2005	-15.0	-13.9?	-14.0	-14.3	-14.5	-14.8	-15.9	-29.6	-30.9	-27.2	-28.9	-25.4	-23.0	-22.3	-21.0	-19.9	-19.0	-17.2	-15.8
24/02/2005	-15.4	-14.3?	-14.3	-14.5	-14.8	-15.1	-16.4	-29.3	-30.7	-27.3	-29.0	-25.4	-23.0	-22.1	-21.4	-20.4	-19.2	-17.6	-16.3
25/02/2005	-15.4	-14.4?	-14.3	-14.6	-14.8	-15.2	-16.4	-29.3	-30.7	-27.3	-29.0	-25.4	-23.0	-22.4	-21.4	-20.4	-19.2	-17.6	-16.4
26/02/2005	-15.4	-14.4?	-14.3	-14.6	-14.8	-15.2	-16.4	-29.3	-30.1	-27.3	-29.0	-25.4	-23.0	-22.4	-21.4	-20.4	-19.2	-17.6	-16.4
27/02/2005	-15.9	-14.9?	-14.8	-15.1	-15.3	-15.7	-16.9	-29.3	-30.1	-27.3	-29.0	-25.4	-23.0	-22.3	-21.4	-20.4	-19.2	-17.6	-16.4
28/02/2005	-15.9	-14.9?	-14.8	-15.1	-15.3	-15.7	-16.9	-29.3	-30.7	-27.3	-29.0	-25.4	-23.0	-22.9	-21.4	-20.4	-19.2	-18.2	-16.9
01/03/2005	-16.4	-15.4?	-15.3	-15.1	-15.8	-15.7	-16.9	-29.3	-30.7	-27.3	-29.0	-25.4	-23.0	-22.3	-21.9	-20.9	-19.7	-18.2	-16.9
02/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-17.4	-29.4	-30.9	-27.3	-29.0	-25.9	-23.5	-22.9	-21.9	-20.9	-19.7	-18.2	-17.4
03/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-17.4	-28.9	-30.4	-27.3	-29.0	-25.9	-23.5	-22.0	-21.9	-20.9	-19.7	-18.7	-17.4
04/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-17.4	-27.9	-29.4	-26.8	-28.0	-25.4	-23.0	-22.6	-21.4	-20.9	-19.7	-18.1	-17.4
05/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-17.4	-27.4	-28.4	-26.3	-27.5	-24.9	-22.5	-22.2	-20.9	-20.4	-19.2	-18.1	-16.9
06/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-17.4	-26.9	-27.9	-25.8	-27.0	-24.4	-22.5	-21.4	-20.9	-19.9	-19.2	-17.6	-16.9
07/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-17.4	-26.4	-27.9	-25.3	-27.0	-23.9	-22.0	-21.3	-20.4	-19.9	-18.7	-17.6	-16.4
08/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-17.4	-26.4	-27.4	-25.3	-26.5	-23.9	-22.0	-21.0	-20.4	-19.9	-18.7	-17.6	-16.4
09/03/2005	-16.4	-15.5?	-15.3	-15.6	-15.7	-16.2	-16.9	-25.9	-26.9	-24.7	-26.0	-23.3	-21.5	-20.7	-19.9	-19.4	-18.1	-17.1	-15.9
10/03/2005	-15.8	-15.4?	-15.2	-15.4	-15.6	-15.8	-16.9	-25.5	-26.4	-24.4	-25.6	-23.0	-21.0	-20.4	-19.6	-18.9	-17.8	-16.7	-15.7
11/03/2005	-14.8	-15.4?	-15.2	-15.4	-15.6	-15.8	-16.9	-25.5	-26.4	-24.4	-25.6	-23.0	-21.0	-20.2	-19.6	-18.9	-17.8	-16.7	-15.7
12/03/2005	-13.2	-14.4?	-15.2	-15.4	-15.6	-15.8	-16.9	-25.0	-25.9	-24.4	-25.1	-22.5	-21.0	-20.1	-19.6	-18.9	-17.8	-16.7	-15.7
13/03/2005	-12.7	-12.9?	-15.2	-15.4	-15.6	-15.8	-16.9	-25.0	-25.9	-23.8	-25.1	-22.5	-20.5	-20.0	-19.1	-18.9	-17.8	-16.7	-15.2
14/03/2005	-11.7	-11.3?	-15.2	-15.4	-15.6	-15.8	-16.9	-25.0	-25.9	-23.8	-25.1	-22.5	-20.5	-20.0	-19.1	-18.4	-17.8	-16.2	-15.2
15/03/2005	-11.7	-10.3?	-14.6	-15.4	-15.6	-15.8	-16.9	-24.5	-25.4	-23.8	-24.6	-22.0	-20.5	-19.6	-19.1	-18.4	-17.3	-16.2	-15.2
16/03/2005	-11.2	-9.8?	-13.1	-15.4	-15.6	-15.8	-16.9	-24.5	-25.4	-23.3	-24.6	-22.0	-20.0	-19.5	-19.1	-18.4	-17.3	-16.2	-15.2
17/03/2005	-11.2	-9.8?	-12.1	-11.8	-15.6	-15.8	-16.9	-24.5	-25.4	-23.3	-24.6	-22.0	-20.0	-19.4	-18.6	-18.4	-17.3	-16.2	-15.2
18/03/2005	-11.2	-9.8?	-11.6	-9.3	-13.5	-15.8	-16.9	-24.5	-25.4	-23.3	-24.6	-22.0	-20.0	-19.8	-18.6	-18.4	-17.3	-16.2	-15.2

19/03/2005	-11.2	-9.8?	-11.1	-7.7	-9.9	-15.8	-16.9	-24.5	-25.4	-23.3	-24.6	-22.0	-20.0	-19.6	-18.6	-18.4	-17.3	-16.2	-15.2
20/03/2005	-11.2	-9.8?	-10.6	-6.7	-7.8	-12.7	-17.5	-25.0	-25.4	-23.8	-24.6	-22.0	-20.0	-19.6	-19.1	-18.4	-17.3	-16.2	-15.2
21/03/2005	-11.2	-9.8?	-10.1	-6.7	-6.8	-10.0	-13.3	-25.0	-25.4	-23.8	-24.6	-22.0	-20.5	-19.7	-19.1	-18.4	-17.3	-16.2	-15.2
22/03/2005	-11.2	-9.8?	-10.1	-6.7	-6.8	-8.5	-8.6	-25.0	-25.9	-23.8	-24.6	-22.0	-20.5	-19.5	-19.1	-18.4	-17.3	-16.2	-15.2
23/03/2005	-11.2	-9.8?	-10.1	-6.7	-6.8	-8.0	-6.5	-14.2	-25.9	-22.3	-24.1	-22.0	-20.0	-19.1	-18.6	-18.4	-17.3	-16.2	-15.2
24/03/2005	-11.2	-9.8?	-10.1	-6.7	-6.8	-8.0	-5.5	-11.1	-19.7	-21.2	-21.0	-21.0	-19.5	-18.7	-18.6	-17.9	-16.8	-15.7	-15.2
25/03/2005	-11.2	-10.3?	-10.1	-6.7	-6.8	-7.5	-5.0	-10.6	-13.5	-20.7	-20.5	-21.0	-19.5	-19.2	-18.6	-17.9	-16.8	-15.7	-14.7
26/03/2005	-11.7	-10.3?	-10.1	-7.2	-7.3	-7.5	-5.5	-12.6	-14.5	-20.7	-20.5	-22.0	-20.5	-19.7	-19.1	-18.4	-17.3	-16.2	-15.2
27/03/2005	-11.7	-10.8?	-10.1	-7.7	-7.3	-7.5	-6.0	-14.1	-16.1	-20.7	-21.0	-22.5	-20.5	-19.8	-19.6	-18.9	-17.8	-16.7	-15.7
28/03/2005	-11.7	-10.8?	-10.1	-8.2	-7.8	-8.0	-6.5	-15.7	-17.6	-21.2	-21.5	-22.5	-21.0	-20.6	-19.6	-18.9	-18.4	-17.2	-16.2
29/03/2005	-12.4	-11.5?	-10.5	-8.6	-8.7	-8.6	-7.5	-17.1	-18.6	-21.6	-21.8	-23.0	-21.5	-21.1	-20.3	-19.6	-18.6	-17.5	-16.3
30/03/2005	-12.4	-12.0?	-10.5	-9.1	-9.2	-9.1	-8.5	-17.1	-15.0	-20.0	-19.7	-22.0	-21.0	-20.4	-20.3	-19.6	-18.6	-17.5	-16.3
31/03/2005	-12.9	-12.0?	-11.0	-9.7	-9.7	-9.7	-9.0	-15.6	-13.4	-17.4	-17.2	-19.8	-20.5	-19.8	-19.7	-19.0	-18.1	-16.9	-16.3
01/04/2005	-12.9	-12.5?	-11.0	-9.7	-9.7	-9.7	-9.5	-16.1	-13.4	-16.9	-17.2	-19.3	-20.5	-20.1	-19.7	-19.0	-18.1	-16.9	-16.3
02/04/2005	-13.4	-12.5?	-11.0	-10.2	-10.2	-10.2	-10.0	-16.6	-15.0	-16.9	-17.2	-18.3	-20.0	-20.6	-20.3	-19.6	-18.6	-17.5	-16.9
03/04/2005	-13.4	-13.0?	-11.0	-10.7	-10.2	-10.2	-10.0	-17.1	-15.5	-17.0	-17.2	-17.3	-18.9	-20.4	-20.8	-20.1	-19.1	-18.0	-17.4
04/04/2005	-13.4	-13.0?	-11.5	-10.7	-10.8	-10.2	-10.0	-17.1	-16.5	-17.0	-17.2	-16.8	-17.4	-19.3	-20.8	-20.1	-19.1	-18.0	-17.4
05/04/2005	-13.9	-13.5?	-11.5	-11.2	-10.8	-10.2	-10.5	-17.1	-17.0	-17.5	-17.7	-16.8	-16.4	-17.9	-20.3	-20.1	-19.1	-18.0	-17.9

Table C.2 Temperature measurements of Gauge T2 at Shaft A and Gauge T4 at Shaft T

	10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
	A-D2-T2-10	A-D2-T2-09	A-D2-T2-08	A-D2-T2-07	A-D2-T2-06	A-D2-T2-05	A-D2-T2-04	A-D2-T2-03	A-D2-T2-02	A-D2-T2-01	T-D2-T4-01	T-D2-T4-02	T-D2-T4-03	T-D2-T4-04	T-D2-T4-05	T-D2-T4-06	T-D2-T4-07	T-D2-T4-08	T-D2-T4-09	T-D2-T4-10
	0.65	0.66	0.68	0.70	0.70	0.70	0.72	0.74	0.75	0.76	0.57	0.55	0.54	0.52	0.50	0.59	0.65	0.69	0.72	0.75
10/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.9	10.5	10.7	11.7	10.9	10.3	10.1	10.3	13.1	12.5
11/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.6	10.5	10.7	11.5	10.5	10.0	9.9	10.2	12.8	12.3
12/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.6	10.4	10.6	11.5	10.4	10.0	9.8	10.0	12.7	12.2
13/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	10.0	8.3	8.7	9.3	8.7	8.3	8.5	8.8	11.5	11.0
14/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	9.5	6.2	6.8	7.2	7.0	6.6	7.1	7.6	10.3	9.8
15/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	8.3	3.1	3.2	4.0	4.5	4.5	5.2	5.8	8.0	8.0
16/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	7.1	0.3	0.3	1.3	2.1	2.4	3.4	4.5	5.9	6.1
17/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	5.9	-3.3	-3.3	-2.1	-0.2	0.1	1.5	2.2	4.0	4.4
18/01/2005	11.4	11.4	10.6	9.7	9.6	8.7	9.6	?	4.1	2.3	4.0	-8.4	-7.9	-6.0	-3.2	-2.8	-0.1	0.6	2.7	2.7
19/01/2005	10	10.1	9.4	8.8	8.7	7.4	8	?	1.8	0.9	-1.0	-16.5	-12.0	-9.8	-5.7	-5.1	-1.9	-0.5	1.5	1.7
20/01/2005	8.4	8.6	8.4	7.7	7.6	5.9	6.5	?	-3.9	-1.6	-5.6	-23.0	-15.0	-12.4	-8.3	-7.1	-3.5	-2.0	0.5	1.2
21/01/2005	7.3	7.4	7.0	6.3	6.4	4.9	4.9	?	-10.2	-7.3	-13.2	-31.0	-18.5	-15.3	-10.9	-9.4	-5.0	-3.7	-0.7	0.2
22/01/2005	5.1	5.2	5.0	4.9	5.3	3.5	3.4	?	-20.3	-16.2	-19.0	-37.2	-22.1	-18.4	-13.5	-12.4	-7.0	-5.8	-2.2	-1.3
23/01/2005	3.9	3.9	3.8	3.7	4.1	2.0	2.0	?	-26.3	-22.3	-23.0	-40.8	-25.7	-22.0	-16.6	-15.4	-9.5	-7.3	-4.2	-2.8
24/01/2005	2.6	2.7	2.8	2.6	2.8	0.5	0.4	?	-30.5	-25.2	-25.6	-44.4	-28.7	-25.1	-20.1	-18.5	-13.1	-9.9	-6.3	-4.9
25/01/2005	1.9	1.8	2.0	1.8	2.1	-0.8	-1.3	?	-34.6	-29.9	-29.6	-48.0	-32.0	-28.3	-23.3	-20.6	-15.4	-12.3	-7.9	-6.7
26/01/2005	1.1	1.0	1.2	1.1	1.5	-1.9	-2.8	?	-37.4	-31.8	-35.2	-50.0	-32.8	-29.5	-24.5	-22.1	-16.8	-13.7	-9.2	-8.1
27/01/2005	0.0	0.0	0.1	0.6	1.0	-3.4	-5.4	?	-42.1	-34.9	-39.8	-50.0	-33.3	-30.5	-25.5	-23.1	-17.8	-14.8	-10.2	-9.1
28/01/2005	-0.5	-1.0	-0.4	-0.4	0.0	-5.4	-7.5	?	-45.1	-37.4	-44.4	-50.0	-34.3	-31.5	-26.5	-24.2	-18.8	-15.5	-11.2	-9.6
29/01/2005	-1.6	-1.9	-1.4	-1.4	-0.9	-7.4	-9.7	?	-48.2	-39.5	-47.6	-50.0	-35.0	-32.6	-27.9	-25.2	-19.7	-16.4	-12.2	-10.7
30/01/2005	-2.1	-3.0	-2.0	-2.4	-1.9	-8.9	-11.8	?	-49.5	-41.1	-48.2	-50.0	-36.5	-34.1	-28.8	-26.7	-21.2	-17.4	-13.7	-11.7
31/01/2005	-3.0	-3.8	-3.4	-3.4	-3.2	-10.5	-13.4	?	-50.0	-42.6	-48.2	-50.0	-38.1	-35.1	-30.1	-27.9	-22.3	-19.0	-15.0	-13.4
01/02/2005	-3.8	-5.2	-4.7	-4.8	-4.6	-12.6	-15.7	?	-50.0	-43.6	-48.8	-50.0	-36.8	-34.2	-29.3	-26.5	-21.9	-18.6	-15.2	-13.6
02/02/2005	-4.8	-6.2	-5.7	-5.8	-6.2	-13.6	-17.2	?	-50.0	-46.1	-47.2	-50.0	-33.8	-31.1	-26.8	-24.0	-19.9	-17.1	-13.7	-12.6
03/02/2005	-5.8	-7.3	-7.3	-6.9	-7.2	-15.1	-18.5	?	-50.0	-41.6	-49.3	-50.0	-31.3	-28.6	-24.7	-22.4	-17.9	-16.0	-12.7	-12.1
04/02/2005	-6.8	-8.3	-8.3	-8.4	-8.8	-16.2	-19.7	?	-50.0	-40.0	-50.0	-50.0	-29.2	-26.0	-22.7	-20.4	-16.9	-15.0	-12.2	-11.0
05/02/2005	-8.4	-9.3	-9.9	-9.4	-9.8	-17.2	-20.7	?	-50.0	-39.0	-50.0	-50.0	-27.2	-24.5	-21.2	-19.4	-15.8	-14.0	-11.7	-10.5

06/02/2005	-9.4	-10.4	-10.9	-10.4	-11.3	-18.3	-21.7	-50.0	-38.0	-50.0	-50.0	-25.6	-22.9	-19.6	-17.8	-14.8	-13.5	-11.2	-10.0
07/02/2005	-10.4	-11.4	-12.4	-11.4	-12.3	-19.3	-22.9	-49.7	-37.0	-50.0	-50.0	-24.1	-21.4	-18.6	-16.8	-14.3	-12.9	-10.7	-10.0
08/02/2005	-10.9	-11.9	-13.4	-11.9	-12.9	-19.8	-22.9	-47.7	-36.5	-50.0	-50.0	-23.1	-20.3	-17.6	-16.3	-13.8	-12.4	-10.2	-9.5
09/02/2005	-10.4	-11.3	-12.9	-11.4	-12.4	-18.3	-21.3	-43.1	-32.4	-50.0	-50.0	-22.1	-19.3	-16.5	-15.3	-12.8	-11.9	-9.6	-9.5
10/02/2005	-10.4	-10.8	-12.9	-10.9	-11.9	-17.2	-19.8	-39.5	-29.8	-49.2	-50.0	-21.1	-18.3	-16.0	-14.8	-12.8	-11.4	-9.6	-9.5
11/02/2005	-9.9	-10.8	-12.4	-10.9	-11.3	-16.2	-18.3	-36.4	-27.8	-43.5	-20.1	-17.3	-15.5	-14.3	-12.3	-11.4	-9.6	-9.0	-9.0
12/02/2005	-9.9	-10.3	-12.4	-10.4	-10.8	-15.2	-17.3	-33.9	-26.3	-39.9	-39.3	-19.6	-16.8	-15.0	-13.8	-11.8	-10.9	-9.1	-9.0
13/02/2005	-9.6	-10.1	-11.7	-10.2	-10.6	-14.5	-16.3	-32.1	-24.8	-36.8	-36.8	-19.1	-15.7	-14.5	-13.3	-11.8	-10.9	-9.1	-9.0
14/02/2005	-9.6	-10.1	-11.7	-10.2	-10.6	-14.0	-15.4	-30.0	-23.8	-34.3	-34.2	-18.1	-15.2	-14.0	-13.3	-11.2	-10.9	-9.1	-9.0
15/02/2005	-9.6	-10.0	-11.5	-10.0	-10.2	-13.6	-14.7	-28.0	-22.4	-32.0	-32.1	-17.5	-14.8	-13.4	-13.0	-10.9	-10.7	-9.0	-8.9
16/02/2005	-9.4	-9.6	-10.9	-9.7	-9.8	-12.8	-14.1	-26.5	-21.2	-30.1	-30.7	-17.0	-14.2	-13.0	-12.8	-10.8	-10.5	-8.8	-8.7
17/02/2005	-9.4	-9.6	-10.8	-9.6	-9.7	-12.5	-13.7	-25.5	-20.6	-28.9	-29.1	-16.6	-13.8	-12.7	-12.1	-10.7	-10.1	-8.5	-8.5
18/02/2005	-9.4	-9.6	-10.8	-9.6	-9.7	-12.5	-13.4	-24.5	-20.1	-27.8	-27.6	-16.0	-13.8	-12.7	-12.1	-10.6	-10.0	-8.5	-8.5
19/02/2005	-9.4	-9.6	-10.8	-9.6	-9.7	-11.9	-12.9	-23.5	-19.6	-26.3	-26.5	-16.0	-13.3	-12.1	-12.1	-10.6	-10.0	-8.5	-8.5
20/02/2005	-9.4	-9.6	-10.2	-9.6	-9.2	-11.9	-12.4	-22.5	-19.0	-25.3	-25.5	-15.5	-12.8	-12.1	-11.6	-10.6	-10.0	-8.5	-8.5
21/02/2005	-9.4	-9.6	-10.2	-9.1	-9.2	-11.4	-12.4	-21.9	-18.0	-24.3	-24.5	-15.0	-12.8	-12.1	-11.6	-10.6	-10.0	-8.5	-8.5
22/02/2005	-9.4	-9.1	-10.2	-9.1	-9.2	-11.4	-11.8	-20.9	-18.0	-23.3	-24.0	-15.0	-12.3	-11.6	-11.6	-10.6	-10.0	-8.5	-8.5
23/02/2005	-9.4	-9.1	-10.2	-9.1	-9.2	-10.9	-11.8	-20.4	-17.5	-22.7	-23.0	-14.5	-12.3	-11.6	-11.6	-10.1	-10.0	-8.5	-8.5
24/02/2005	-9.2	-9.1	-9.9	-9.0	-8.9	-10.8	-11.4	-19.8	-16.9	-21.7	-22.2	-14.3	-11.9	-11.3	-11.2	-10.1	-9.8	-8.5	-8.5
25/02/2005	-9.2	-9.1	-9.9	-9.0	-8.9	-10.7	-11.3	-19.6	-16.8	-21.0	-22.0	-14.2	-11.9	-11.3	-11.2	-10.1	-9.8	-8.5	-8.6
26/02/2005	-9.2	-9.1	-9.9	-9.0	-8.9	-10.7	-11.1	-19.1	-16.3	-20.5	-21.0	-14.2	-11.9	-11.3	-11.2	-10.1	-9.8	-8.5	-8.6
27/02/2005	-9.2	-9.1	-9.9	-9.0	-8.9	-10.7	-11.1	-18.6	-16.3	-20.0	-21.0	-13.7	-11.9	-11.3	-11.2	-10.1	-9.8	-8.5	-8.6
28/02/2005	-9.2	-9.1	-9.9	-9.0	-8.9	-10.2	-11.1	-18.1	-15.8	-19.5	-20.5	-13.7	-11.4	-11.3	-11.2	-10.1	-9.8	-8.5	-8.6
01/03/2005	-9.2	-9.1	-9.9	-9.0	-8.9	-10.2	-10.5	-17.6	-15.8	-19.5	-20.0	-13.7	-11.4	-11.3	-11.2	-10.1	-9.8	-8.5	-8.6
02/03/2005	-9.2	-9.1	-9.9	-9.0	-8.7	-10.2	-10.5	-17.6	-15.5	-19.0	-19.5	-13.7	-11.4	-11.3	-11.2	-10.1	-9.8	-8.5	-8.6
03/03/2005	-9.2	-9.1	-9.9	-9.0	-8.7	-10.2	-10.5	-17.6	-15.5	-18.5	-19.5	-13.2	-11.4	-10.8	-11.2	-10.1	-9.8	-8.5	-8.6
04/03/2005	-9.2	-9.1	-9.9	-9.0	-8.7	-10.2	-10.5	-17.1	-15.0	-18.5	-18.9	-13.2	-11.4	-10.8	-11.2	-10.1	-9.8	-8.5	-8.6
05/03/2005	-9.2	-9.1	-9.9	-9.0	-8.7	-10.2	-10.5	-16.6	-15.0	-18.0	-18.4	-13.2	-11.4	-10.8	-11.2	-10.1	-9.8	-8.5	-8.6
06/03/2005	-9.2	-9.1	-9.9	-9.0	-8.7	-10.2	-10.5	-16.6	-15.0	-17.5	-18.4	-13.2	-10.9	-10.8	-11.2	-10.1	-9.8	-8.5	-8.6
07/03/2005	-9.2	-9.1	-9.9	-9.0	-8.7	-10.2	-10.1	-16.0	-14.5	-17.5	-17.9	-12.7	-10.9	-10.8	-11.2	-10.1	-9.8	-8.5	-8.6
08/03/2005	-9.2	-9.1	-9.9	-9.0	-8.7	-10.2	-10.0	-16.0	-14.5	-17.0	-17.9	-12.7	-10.9	-10.8	-11.2	-10.1	-9.8	-8.5	-8.6
09/03/2005	-9.2	-9.1	-9.4	-9.0	-8.7	-9.7	-10.0	-15.5	-14.5	-17.0	-17.4	-12.7	-10.9	-10.8	-11.2	-10.1	-9.8	-8.5	-8.6
10/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.7	-9.8	-15.4	-14.0	-16.4	-17.1	-12.4	-10.6	-10.5	-10.7	-10.0	-9.9	-8.7	-9.0
11/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.7	-9.8	-15.4	-14.0	-16.4	-17.1	-12.4	-10.6	-10.5	-10.7	-10.0	-9.9	-8.7	-9.0
12/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.7	-9.6	-14.9	-14.0	-15.9	-16.6	-12.4	-10.6	-10.5	-10.7	-10.0	-9.9	-8.7	-9.0

13/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.7	-9.5?	-14.9	-13.5	-15.9	-16.6	-12.4	-10.6	-10.5	-10.7	-10.0	-9.9	-8.7	-9.0
14/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.7	-9.5?	-14.9	-13.5	-15.4	-16.1	-11.9	-10.6	-10.5	-10.7	-10.0	-9.9	-8.7	-9.0
15/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-14.4	-13.5	-15.4	-16.1	-11.9	-10.1	-10.5	-10.7	-10.0	-9.9	-8.7	-9.0
16/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-14.4	-13.0	-14.9	-15.6	-11.9	-10.1	-10.0	-10.2	-10.0	-9.9	-8.7	-9.0
17/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-14.4	-13.0	-14.9	-15.6	-11.9	-10.1	-10.0	-10.2	-9.5	-9.9	-8.7	-9.0
18/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-13.8	-13.0	-14.9	-15.6	-11.4	-10.1	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
19/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.1?	-13.8	-13.0	-14.9	-15.6	-11.4	-10.1	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
20/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.1?	-13.8	-13.0	-14.4	-15.1	-11.4	-10.1	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
21/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.1?	-13.8	-13.0	-14.4	-15.1	-11.4	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
22/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.1?	-13.8	-13.0	-14.4	-15.1	-11.4	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
23/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-13.8	-12.5	-14.4	-15.1	-11.4	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
24/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-13.8	-12.5	-14.4	-15.1	-11.4	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
25/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-13.8	-12.5	-14.4	-15.1	-11.4	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
26/03/2005	-9.5	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-13.8	-12.5	-14.4	-15.1	-10.9	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
27/03/2005	-10.0	-9.1	-9.5	-9.0	-8.5	-9.2	-9.2?	-13.8	-12.5	-14.4	-15.1	-10.9	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
28/03/2005	-10.0	-9.6	-9.5	-9.5	-8.5	-9.2	-9.3?	-13.8	-12.5	-14.4	-15.1	-10.9	-9.6	-10.0	-10.2	-9.5	-9.4	-8.7	-9.0
29/03/2005	-10.1	-9.6	-9.9	-9.4	-8.7	-9.3	-9.2?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2
30/03/2005	-10.1	-9.6	-9.9	-9.4	-8.7	-9.3	-9.2?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2
31/03/2005	-10.1	-9.6	-9.9	-9.4	-8.7	-9.3	-9.2?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2
01/04/2005	-10.1	-10.1	-9.9	-9.4	-8.7	-9.3	-9.2?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2
02/04/2005	-10.6	-10.1	-9.9	-9.4	-8.7	-9.3	-9.2?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2
03/04/2005	-10.6	-10.1	-9.9	-9.4	-8.7	-9.3	-9.0?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2
04/04/2005	-10.1	-10.1	-9.9	-9.4	-8.7	-9.3	-9.0?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2
05/04/2005	-10.1	-9.6	-9.9	-9.4	-8.7	-9.3	-9.0?	-13.5	-12.5	-14.1	-14.9	-10.9	-9.5	-9.5	-9.9	-9.5	-9.5	-8.5	-9.2

Table C.3 Temperature measurements of Gauge T3 at Shaft A and Gauge T3 at Shaft T

	10	9	8	7	6	5	4	3	2	1		2	3	4	5	6	7	8	9	10	11	12	13
	A-D2-T3-10	A-D2-T3-09	A-D2-T3-08	A-D2-T3-07	A-D2-T3-06	A-D2-T3-05	A-D2-T3-04	A-D2-T3-03	A-D2-T3-02	A-D2-T3-01	T-D2-T3-01	T-D2-T3-02	T-D2-T3-03	T-D2-T3-04	T-D2-T3-05	T-D2-T3-06	T-D2-T3-07	T-D2-T3-08	T-D2-T3-09	T-D2-T3-10	T-D2-T3-11	T-D2-T3-12	T-D2-T3-13
	0.40	0.38	0.36	0.35	0.35	0.35	0.36	0.38	0.45	0.35	0.47	0.45	0.43	0.41	0.40	0.41	0.43	0.44	0.45	0.45	0.45	0.45	0.45
10/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	11.2	10.8	10.8	11.0	11.1	10.7	11.0	9.6	9.6	9.3	10.1	11.4	10.2
11/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.6	10.1	10.5	10.5	10.5	10.3	10.3	9.0	9.3	8.6	9.7	10.8	9.8
12/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	8.4	7.5	8.1	8.0	8.3	8.2	8.5	7.2	7.6	6.9	8.1	9.3	8.4
13/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	6.5	5.5	6.4	6.1	6.5	6.5	6.9	5.7	6.1	5.5	6.7	8.0	7.1
14/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	4.7	3.5	4.7	4.3	4.8	4.8	5.3	4.1	4.6	4.0	5.3	6.6	5.8
15/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	3.4	2.3	3.6	4.2	3.7	3.7	4.4	3.0	3.5	3.0	4.1	5.4	4.6
16/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	2.1	1.2	2.5	2.1	2.6	2.5	3.1	1.9	2.4	1.9	3.1	4.4	3.4
17/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	0.8	0.2	1.4	1.0	1.5	1.5	2.0	0.8	1.3	0.9	2.1	3.3	2.1
18/01/2005	-0.7	-0.8	-0.7	-1.7	-1.3	-0.8	0.6	0.2	-10.2	-8.5	0.1	-2.3	-0.2	0.1	0.5	0.6	1.2	0.0	0.5	0.1	0.9	2.1	1.5
19/01/2005	-1.4	-1.6	-2.1	-2.4	-2.2	-1.4	-0.6	-0.8	-15.1	-13.1	-2.8	-7.6	-2.4	-2.4	-0.5	0.0	0.6	-0.7	-0.2	-0.7	0.2	1.1	0.4
20/01/2005	-2.0	-2.1	-3.1	-3.4	-3.2	-1.9	-1.7	-1.8	-19.1	-17.2	-6.4	-11.6	-6.5	-5.4	-2.6	-1.5	-0.4	-1.8	-0.8	-1.2	-0.4	0.6	-0.1
21/01/2005	-2.2	-2.5	-3.1	-3.5	-3.2	-2.7	-2.3	-3.1	-20.8	-18.9	-9.1	-14.7	-9.2	-8.2	-4.6	-3.2	-1.7	-2.8	-1.5	-1.7	-1.2	-0.2	-1.0
22/01/2005	-3.0	-3.5	-4.7	-4.9	-5.2	-4.8	-4.9	-6.0	-24.9	-22.8	-12.7	-18.7	-12.8	-11.2	-7.1	-5.2	-3.2	-4.3	-2.5	-2.7	-2.2	-1.3	-2.0
23/01/2005	-4.5	-4.7	-5.8	-6.0	-7.7	-6.7	-6.8	-9.3	-29.1	-26.4	-16.3	-22.8	-16.8	-14.8	-10.7	-8.8	-6.3	-7.4	-5.1	-4.7	-4.3	-2.8	-3.5
24/01/2005	-5.7	-6.2	-7.3	-8.4	-9.0	-8.6	-8.3	-11.7	-32.8	-30.4	-19.8	-27.4	-20.0	-17.8	-13.7	-11.4	-9.4	-10.0	-7.6	-6.9	-6.4	-4.8	-5.0
25/01/2005	-6.6	-6.9	-8.5	-9.8	-10.4	-10.4	-10.2	-13.7	-34.3	-31.9	-22.3	-29.8	-22.0	-20.2	-16.0	-13.3	-11.4	-12.3	-9.4	-9.4	-8.3	-6.2	-6.8
26/01/2005	-8.0	-8.4	-10.2	-11.5	-11.8	-12.0	-11.1	-15.5	-35.8	-33.2	-24.1	-31.5	-23.7	-21.8	-17.6	-15.3	-13.6	-13.8	-11.4	-10.7	-10.2	-7.9	-8.4
27/01/2005	-9.5	-9.9	-11.8	-13.1	-13.8	-13.6	-13.7	-17.6	-36.8	-33.7	-25.1	-32.0	-24.7	-22.8	-19.2	-16.8	-15.1	-15.4	-13.4	-12.2	-12.2	-9.5	-10.0
28/01/2005	-10.5	-11.0	-12.8	-14.1	-14.8	-15.1	-15.7	-19.1	-37.3	-34.8	-26.6	-33.1	-25.3	-23.3	-20.2	-17.8	-16.1	-16.4	-14.5	-13.7	-13.2	-10.5	-11.0
29/01/2005	-12.0	-12.3	-14.5	-15.8	-16.5	-17.2	-17.7	-21.4	-38.8	-35.5	-28.8	-34.5	-26.3	-24.4	-20.9	-19.5	-17.5	-18.1	-16.0	-15.0	-14.6	-12.1	-12.6
30/01/2005	-13.0	-13.4	-16.0	-17.4	-18.0	-18.3	-19.2	-23.0	-39.3	-36.5	-30.9	-35.5	-27.3	-25.4	-22.4	-20.5	-18.5	-19.1	-17.0	-16.1	-15.6	-13.1	-13.7
31/01/2005	-14.2	-14.4	-16.9	-18.3	-18.7	-19.6	-20.4	-23.8	-40.0	-36.8	-32.7	-36.2	-28.6	-26.7	-23.5	-21.9	-19.9	-20.5	-18.6	-17.7	-17.2	-14.9	-15.3
01/02/2005	-15.6	-15.3	-18.1	-19.6	-20.1	-20.4	-21.6	-25.2	-41.0	-37.5	-33.4	-36.9	-29.3	-27.4	-24.2	-22.6	-20.7	-21.2	-19.3	-18.5	-18.1	-15.6	-16.5
02/02/2005	-16.1	-16.4	-18.7	-20.1	-20.6	-21.4	-22.1	-25.7	-38.5	-37.0	-33.9	-36.9	-29.8	-27.9	-24.7	-23.2	-21.7	-22.2	-20.4	-19.5	-19.1	-16.6	-17.0
03/02/2005	-16.6	-16.9	-19.2	-20.6	-21.1	-21.4	-22.6	-25.7	-36.8	-36.0	-33.9	-36.9	-29.8	-27.9	-24.7	-23.7	-22.2	-22.7	-20.9	-19.5	-19.6	-17.6	-18.0
04/02/2005	-17.1	-17.4	-19.2	-20.6	-21.1	-21.9	-22.6	-25.7	-36.6	-35.0	-33.9	-36.4	-29.8	-27.9	-25.2	-23.7	-22.2	-22.7	-21.4	-20.0	-20.1	-18.2	-18.5
05/02/2005	-17.6	-18.0	-19.2	-20.6	-21.6	-21.9	-22.6	-25.7	-36.4	-34.4	-33.9	-35.9	-29.3	-27.9	-25.2	-24.2	-22.7	-23.3	-21.9	-20.6	-20.6	-18.7	-19.0
06/02/2005	-18.1	-18.0	-19.7	-20.6	-21.6	-21.9	-23.1	-25.7	-35.9	-33.9	-33.9	-35.9	-29.3	-27.9	-25.2	-24.2	-22.7	-23.3	-22.4	-21.4	-21.1	-19.2	-19.5
07/02/2005	-18.7	-18.5	-19.7	-21.1	-21.6	-21.9	-23.1	-25.7	-35.8	-33.9	-33.9	-35.9	-29.3	-27.9	-25.2	-24.2	-22.7	-23.8	-22.4	-21.6	-21.1	-19.7	-20.0
08/02/2005	-19.2	-19.0	-20.2	-21.1	-21.6	-22.4	-23.1	-25.7	-35.3	-33.4	-34.4	-35.9	-29.3	-27.4	-25.2	-24.7	-23.2	-23.8	-22.9	-21.6	-21.6	-20.2	-20.5
09/02/2005	-19.7	-19.0	-20.2	-21.1	-22.1	-22.4	-23.1	-25.7	-35.3	-33.4	-34.4	-35.4	-28.8	-27.4	-25.2	-24.7	-23.2	-24.3	-22.9	-22.1	-22.1	-20.2	-21.1
10/02/2005	-19.7	-19.6	-20.7	-21.1	-22.1	-22.4	-23.1	-25.7	-34.8	-33.4	-33.9	-34.8	-28.8	-27.4	-25.2	-24.7	-23.2	-24.3	-23.4	-22.1	-22.1	-20.7	-21.1
11/02/2005	-20.2	-19.6	-20.7	-21.1	-22.1	-22.4	-23.1	-25.2	-34.8	-33.4	-33.4	-34.3	-28.8	-27.4	-25.7	-25.2	-23.8	-24.3	-23.4	-22.6	-22.7	-21.3	-21.6
12/02/2005	-20.2	-19.6	-20.7	-21.1	-22.1	-22.4	-23.1	-25.2	-34.8	-32.9	-32.9	-33.8	-28.8	-27.4	-25.7	-25.2	-23.8	-24.8	-23.4	-22.6	-22.7	-21.3	-21.6

13/02/2005	-20.4	-19.9	-21.0	-21.5	-21.9	-22.4	-23.2	-25.1	-33.8	-32.9	-32.4	-33.8	-28.8	-27.4	-25.7	-25.2	-24.3	-24.8	-23.9	-23.1	-23.2	-21.8	-22.1
14/02/2005	-20.4	-19.9	-21.0	-21.5	-21.9	-22.4	-23.2	-25.0	-34.0	-32.9	-32.4	-33.3	-28.8	-27.4	-25.7	-25.2	-24.3	-25.3	-23.9	-23.1	-23.2	-21.8	-22.6
15/02/2005	-20.7	-20.1	-21.1	-21.5	-22.0	-22.4	-23.2	-25.0	-34.0	-32.8	-32.0	-33.1	-28.9	-27.5	-26.0	-25.8	-24.6	-25.5	-24.1	-23.6	-23.8	-22.0	-22.8
16/02/2005	-21.0	-20.4	-21.2	-21.6	-22.1	-22.4	-23.2	-24.9	-34.0	-32.7	-31.8	-33.0	-28.9	-27.6	-26.2	-26.0	-24.7	-25.7	-24.5	-23.9	-24.0	-22.5	-23.1
17/02/2005	-21.1	-20.4	-21.2	-21.6	-22.0	-22.3	-22.9	-24.8	-33.8	-32.5	-31.4	-32.9	-29.0	-27.9	-26.6	-26.2	-24.9	-25.9	-25.0	-24.2	-24.4	-23.0	-23.5
18/02/2005	-21.1	-20.4	-21.2	-21.6	-22.0	-22.3	-22.9	-24.8	-33.8	-32.5	-31.4	-32.9	-29.0	-27.9	-26.6	-26.2	-24.9	-25.9	-25.0	-24.2	-24.4	-23.0	-23.5
19/02/2005	-21.1	-20.4	-21.2	-21.6	-22.0	-22.3	-22.9	-24.8	-33.8	-32.5	-31.4	-32.9	-29.0	-27.9	-26.6	-26.2	-24.9	-25.9	-25.0	-24.2	-24.4	-23.0	-23.5
20/02/2005	-21.1	-20.4	-21.2	-21.6	-22.0	-22.3	-22.9	-24.8	-33.8	-32.5	-31.4	-32.9	-29.0	-27.9	-26.6	-26.2	-24.9	-25.9	-25.0	-24.2	-24.4	-23.5	-24.0
21/02/2005	-21.1	-20.4	-21.2	-21.6	-22.0	-22.3	-22.9	-24.8	-33.8	-32.5	-31.4	-32.9	-29.0	-27.9	-26.6	-26.2	-24.9	-25.9	-25.0	-24.2	-24.4	-23.5	-24.0
22/02/2005	-21.1	-20.4	-21.2	-21.6	-22.0	-22.3	-22.9	-24.8	-33.8	-32.5	-31.4	-32.9	-29.0	-27.9	-26.6	-26.2	-24.9	-25.9	-25.0	-24.2	-24.4	-23.5	-24.0
23/02/2005	-21.1	-20.4	-21.2	-21.6	-22.0	-22.3	-22.9	-24.8	-33.8	-32.5	-31.4	-32.9	-29.0	-27.9	-26.6	-26.2	-24.9	-25.9	-25.0	-24.2	-24.4	-23.5	-24.0
24/02/2005	-21.2	-20.9	-21.4	-21.6	-21.8	-21.7	-22.4	-24.0	-32.8	-31.8	-30.4	-32.2	-29.2	-28.5	-27.4	-27.0	-26.1	-27.0	-26.2	-25.6	-25.6	-24.6	-25.0
25/02/2005	-21.4	-20.9	-21.5	-21.6	-21.8	-21.8	-22.4	-24.0	-32.7	-31.7	-30.3	-32.1	-29.2	-28.4	-27.4	-27.1	-26.0	-27.1	-26.2	-25.7	-25.7	-24.6	-25.1
26/02/2005	-21.4	-20.9	-21.5	-21.6	-21.8	-21.8	-22.4	-24.0	-32.2	-31.2	-30.3	-31.6	-29.2	-28.4	-27.4	-27.1	-26.0	-27.1	-26.2	-25.7	-25.7	-24.6	-25.1
27/02/2005	-21.9	-21.4	-22.0	-22.1	-21.8	-21.8	-22.4	-24.0	-32.7	-31.7	-30.3	-31.6	-29.2	-28.4	-27.4	-27.1	-26.0	-27.1	-26.2	-25.7	-25.7	-24.6	-25.1
28/02/2005	-21.9	-21.4	-22.0	-22.1	-21.8	-21.8	-22.4	-24.0	-32.7	-31.7	-30.3	-32.1	-29.2	-28.4	-27.4	-27.1	-26.0	-27.1	-26.2	-25.7	-25.7	-24.6	-25.1
01/03/2005	-21.9	-21.4	-22.0	-22.1	-21.8	-21.8	-22.4	-24.0	-32.7	-31.7	-30.3	-32.1	-29.2	-28.4	-27.4	-27.1	-26.0	-27.1	-26.2	-25.7	-25.7	-24.6	-25.1
02/03/2005	-21.9	-21.4	-22.0	-22.1	-21.8	-21.8	-22.4	-24.0	-32.7	-31.7	-30.3	-32.1	-29.2	-28.9	-27.9	-27.6	-26.5	-27.6	-26.8	-26.7	-26.2	-25.6	-26.1
03/03/2005	-21.3	-20.9	-21.4	-21.6	-21.8	-21.8	-21.9	-23.5	-31.2	-30.7	-29.8	-31.6	-29.2	-28.4	-27.4	-27.1	-26.5	-27.6	-26.8	-26.1	-26.1	-25.6	-26.1
04/03/2005	-21.3	-20.9	-21.4	-21.6	-21.8	-21.8	-21.9	-23.0	-30.2	-29.6	-28.8	-30.0	-28.2	-27.4	-26.9	-26.6	-26.5	-26.6	-26.3	-25.6	-25.6	-25.1	-25.1
05/03/2005	-21.3	-20.9	-21.4	-21.1	-21.2	-21.3	-21.4	-23.0	-29.7	-29.1	-28.3	-29.5	-27.7	-26.9	-26.4	-26.1	-25.0	-26.1	-25.7	-25.1	-25.1	-24.6	-25.1
06/03/2005	-20.8	-20.4	-20.9	-21.1	-21.2	-20.8	-21.4	-22.5	-29.2	-28.6	-27.8	-29.0	-27.2	-26.4	-25.9	-25.6	-25.0	-26.1	-25.2	-25.1	-25.1	-24.1	-24.6
07/03/2005	-20.8	-20.4	-20.9	-21.1	-20.7	-20.8	-21.4	-22.5	-29.2	-28.6	-27.8	-29.0	-26.7	-26.4	-25.9	-25.6	-24.5	-25.6	-25.2	-24.6	-24.6	-24.1	-24.6
08/03/2005	-20.8	-20.4	-20.9	-21.1	-20.7	-20.8	-20.9	-22.5	-28.7	-28.1	-27.3	-28.5	-26.7	-25.9	-25.4	-25.0	-24.5	-25.6	-24.7	-24.1	-24.1	-23.6	-24.1
09/03/2005	-20.3	-20.4	-20.9	-20.6	-20.7	-20.8	-20.9	-21.9	-28.1	-27.6	-26.8	-28.0	-25.7	-25.4	-24.9	-24.5	-24.0	-25.1	-24.2	-23.6	-24.1	-23.1	-23.6
10/03/2005	-20.3	-20.3	-20.8	-20.8	-20.6	-20.5	-20.9	-22.1	-27.9	-27.3	-26.2	-27.3	-25.5	-25.1	-24.4	-24.2	-23.5	-24.6	-24.0	-23.4	-23.6	-22.8	-23.2
11/03/2005	-12.0	-20.3	-20.8	-20.8	-20.6	-20.5	-20.9	-22.1	-27.9	-27.3	-26.2	-27.3	-25.5	-25.1	-24.4	-24.2	-23.5	-24.6	-24.0	-23.4	-23.6	-22.8	-23.2
12/03/2005	-9.4	-14.0	-20.8	-20.8	-20.6	-20.5	-20.9	-22.1	-27.4	-26.8	-25.7	-26.8	-25.0	-24.6	-23.9	-23.7	-23.0	-24.1	-23.5	-22.9	-23.1	-22.8	-23.2
13/03/2005	-8.4	-6.3	-20.8	-20.8	-20.6	-20.5	-20.9	-22.1	-27.4	-26.8	-25.2	-26.8	-25.0	-24.6	-23.9	-23.7	-23.0	-24.1	-23.5	-22.9	-23.1	-22.3	-22.7
14/03/2005	-8.4	-3.7	-18.2	-20.8	-20.6	-20.5	-20.9	-21.6	-27.4	-26.8	-25.2	-26.8	-25.0	-24.6	-23.9	-23.7	-23.0	-24.1	-23.5	-22.9	-23.1	-22.3	-22.7
15/03/2005	-8.4	-3.2	-14.1	-20.3	-20.1	-19.9	-20.4	-21.6	-26.9	-26.3	-24.7	-26.3	-24.5	-24.1	-23.4	-23.2	-22.5	-23.6	-23.5	-22.3	-22.6	-22.3	-22.7
16/03/2005	-8.4	-4.2	-12.6	-17.7	-20.1	-19.9	-20.4	-21.6	-26.9	-26.3	-24.7	-26.8	-24.5	-24.1	-23.4	-23.2	-22.5	-23.6	-23.0	-22.3	-22.6	-22.3	-22.2
17/03/2005	-8.9	-5.2	-11.5	-15.2	-19.6	-19.9	-20.4	-21.6	-26.9	-26.3	-24.7	-26.8	-24.5	-24.1	-23.4	-23.2	-22.5	-23.6	-23.0	-22.3	-22.6	-22.3	-22.2
18/03/2005	-8.9	-6.3	-11.5	-14.1	-14.4	-19.9	-20.4	-21.6	-26.9	-26.3	-24.7	-26.8	-24.5	-24.1	-23.4	-23.2	-22.5	-23.6	-23.0	-22.3	-22.6	-22.3	-22.2
19/03/2005	-8.9	-6.8	-11.0	-13.1	-11.8	-13.8	-20.4	-21.6	-27.4	-26.8	-25.2	-26.3	-24.5	-24.1	-23.4	-23.2	-22.5	-23.6	-23.0	-22.3	-22.6	-22.3	-22.2
20/03/2005	-9.4	-7.3	-11.0	-13.1	-10.3	-9.2	-20.4	-21.6	-27.4	-26.8	-25.2	-26.3	-24.5	-24.1	-23.4	-23.2	-23.0	-24.1	-23.5	-22.9	-23.1	-22.3	-22.7
21/03/2005	-10.4	-8.9	-11.0	-12.6	-10.3	-7.1	-13.7	-21.6	-27.4	-26.8	-25.2	-26.3	-24.5	-24.1	-23.4	-23.7	-23.0	-24.1	-23.5	-22.9	-23.1	-22.3	-22.7
22/03/2005	-11.4	-9.9	-11.0	-12.6	-10.3	-6.6	-10.7	-16.4	-26.9	-26.8	-25.7	-26.8	-25.0	-24.6	-23.9	-23.7	-23.0	-24.1	-23.5	-23.4	-23.6	-22.8	-23.2
23/03/2005	-11.9	-10.4	-11.5	-13.1	-8.6	-7.2	-9.1	-12.8	-26.4	-26.3	-26.2	-27.3	-25.0	-25.1	-24.4	-24.2	-23.5	-24.6	-24.0	-23.4	-23.6	-22.8	-23.2
24/03/2005	-11.9	-10.4	-11.5	-13.1	-8.6	-7.7	-8.6	-10.8	-19.7	-25.2	-17.5	-27.8	-25.5	-25.1	-24.4	-24.2	-23.5	-24.6	-24.0	-23.9	-23.6	-23.3	-23.2
25/03/2005	-12.4	-11.4	-11.5	-13.1	-10.6	-8.2	-8.6	-10.3	-20.2	-26.3	-13.9	-27.8	-25.5	-25.1	-24.4	-24.2	-24.0	-25.1	-24.5	-23.7	-24.1	-23.3	-23.7
26/03/2005	-13.0	-12.4	-12.0	-13.1	-11.1	-8.7	-8.6	-10.3	-21.2	-26.3	-13.4	-26.8	-25.5	-25.1	-24.4	-24.2	-24.0	-25.1	-24.5	-23.7	-24.1	-23.3	-23.7

27/03/2005	-14.0	-13.5	-12.6	-13.6	-11.6	-9.7	-9.1	-10.8	-22.3	-26.8	-14.5	-26.3	-25.5	-25.6	-24.9	-24.8	-24.0	-25.1	-24.5	-23.7	-24.1	-23.3	-23.7
28/03/2005	-14.5	-14.0	-13.1	-14.2	-12.2	-10.8	-10.1	-11.8	-23.3	-26.8	-16.0	-26.3	-25.5	-25.6	-24.9	-24.8	-24.0	-25.1	-24.5	-24.3	-24.1	-23.9	-23.7
29/03/2005	-14.9	-14.7	-13.8	-14.7	-12.7	-11.9	-11.0	-13.1	-24.1	-27.1	-17.1	-26.3	-26.1	-25.9	-25.2	-25.2	-24.3	-25.5	-25.0	-24.4	-24.5	-24.1	-24.3
30/03/2005	-14.9	-14.7	-14.3	-15.2	-13.7	-12.9	-12.0	-13.6	-21.1	-18.8	-17.7	-18.6	-26.1	-25.9	-25.2	-25.2	-24.8	-25.5	-25.0	-24.4	-25.0	-24.1	-24.3
31/03/2005	-14.9	-14.7	-14.8	-15.2	-14.2	-13.4	-12.5	-14.1	-19.6	-14.2	-17.2	-14.5	-26.6	-26.4	-25.7	-25.7	-24.8	-26.0	-25.5	-24.9	-25.0	-24.6	-24.8
01/04/2005	-14.9	-14.7	-15.3	-15.7	-14.2	-13.4	-12.5	-14.1	-18.6	-11.1	-16.7	-12.4	-16.9	-26.4	-25.7	-25.7	-24.8	-26.0	-25.5	-24.9	-25.0	-24.6	-24.8
02/04/2005	-14.9	-14.7	-15.3	-15.7	-14.2	-13.4	-13.0	-14.1	-22.2	-14.7	-16.2	-12.9	-12.5	-16.7	-25.7	-25.7	-24.8	-26.0	-25.5	-24.9	-25.0	-24.6	-24.8
03/04/2005	-14.9	-14.7	-15.3	-15.7	-14.8	-13.9	-13.0	-14.1	-23.2	-17.2	-15.5	-14.6	-11.3	-8.6	-25.8	-25.7	-24.8	-26.0	-25.5	-24.9	-25.0	-24.6	-24.8
04/04/2005	-14.9	-14.7	-15.3	-15.7	-14.8	-13.9	-13.5	-14.1	-23.2	-19.3	-15.0	-16.1	-10.8	-6.1	-18.6	-25.2	-24.8	-26.0	-25.5	-24.9	-25.0	-24.6	-24.8
05/04/2005	-14.9	-14.7	-15.3	-16.2	-14.8	-14.4	-13.5	-14.1	-23.2	-20.3	-14.5	-17.1	-10.8	-6.1	-14.0	-18.5	-23.2	-26.0	-25.5	-24.9	-25.0	-24.6	-24.8

Table C.4 Temperature measurements of Gauge T4 at Shaft A and Gauge T2 at Shaft T																				
	10	9	8	7	6	5	4	3	2	1	T-D2-T2-01	T-D2-T2-02	T-D2-T2-03	T-D2-T2-04	T-D2-T2-05	T-D2-T2-06	T-D2-T2-07	T-D2-T2-08	T-D2-T2-09	T-D2-T2-10
	A-D2-T4-10	A-D2-T4-09	A-D2-T4-08	A-D2-T4-07	A-D2-T4-06	A-D2-T4-05	A-D2-T4-04	A-D2-T4-03	A-D2-T4-02	A-D2-T4-01										
	0.75	0.68	0.62	0.55	0.50	0.45	0.51	0.58	0.65	0.70	1.03	0.95	0.89	0.81	0.75	0.75	0.75	0.75	0.75	0.75
10/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	9.9	10.3	10.3	10.3	11.1	9.9	9.2	9.4	10.1	12.6
11/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	9.9	10.2	10.3	10.8	9.9	9.2	9.1	9.7	12.4	12.1
12/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	9.7	10.1	10.2	10.8	9.8	9.1	9.1	9.7	12.3	12.0
13/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	9.1	9.6	9.6	10.3	9.2	8.5	8.6	9.1	11.6	11.1
14/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	8.5	9.1	9.0	9.8	8.7	8.0	8.1	8.6	10.9	10.2
15/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	6.9	7.5	7.2	8.3	7.1	6.6	6.6	7.1	9.2	8.6
16/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	5.2	5.9	5.5	6.8	5.5	5.1	5.1	5.6	7.7	7.0
17/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	3.6	4.3	3.7	5.0	3.9	3.8	3.8	4.3	6.1	5.4
18/01/2005	10.8	10.9	10.0	9.2	6.6	7.2	4.5	4.7	4.6	3.4	1.4	2.0	1.7	3.5	2.6	2.1	2.5	3.1	4.5	3.9
19/01/2005	9.4	9.2	7.4	6.4	2	2.8	-1.9	-2.8	0.2	-0.9	-2.7	0.4	0.1	2.1	1.4	1.1	1.6	2.1	3.3	2.9
20/01/2005	7.3	7.2	5.3	3.8	-0.6	0.2	-8.1	-9.4	-4.6	-6.1	-8.9	-4.2	-2.0	1.1	0.4	0.6	1.1	1.6	2.3	1.9
21/01/2005	5.7	5.3	3.3	1.6	-4.0	-0.5	-15.9	-19.1	-18.1	-15.2	-18.9	-11.0	-4.2	-0.1	-0.8	-0.9	-0.2	0.6	1.8	1.4
22/01/2005	2.7	2.5	2.3	-0.8	-9.9	-5.4	-24.8	-25.7	-27.9	-24.8	-29.2	-18.7	-7.3	-1.6	-2.3	-2.4	-0.8	-0.4	0.8	0.4
23/01/2005	1.5	1.3	0.4	-3.2	-14.0	-9.9	-30.2	-31.7	-35.7	-29.9	-36.9	-25.3	-11.9	-4.2	-4.8	-4.4	-2.4	-1.4	0.2	-0.7
24/01/2005	0.7	-0.1	-1.7	-5.1	-17.7	-14.6	-34.8	-37.1	-44.1	-36.6	-44.2	-33.6	-15.9	-7.8	-7.8	-7.5	-4.4	-2.4	-0.8	-1.7
25/01/2005	-0.1	-0.7	-3.4	-5.9	-19.1	-15.8	-34.1	-38.9	-49.0	-40.9	-49.4	-38.7	-19.6	-11.1	-10.9	-10.4	-6.8	-4.0	-1.7	-3.1
26/01/2005	-0.5	-1.9	-3.8	-6.3	-19.2	-16.1	-33.4	-39.2	-50.0	-43.4	-50.0	-41.6	-22.1	-14.2	-13.1	-12.6	-8.5	-5.4	-2.5	-5.0
27/01/2005	-1.0	-2.9	-5.4	-8.3	-23.3	-20.7	-39.1	-47.0	-50.0	-47.5	-50.0	-44.7	-23.6	-16.2	-15.1	-14.1	-10.6	-6.9	-4.1	-6.0
28/01/2005	-1.6	-4.0	-5.9	-10.4	-25.9	-23.2	-41.7	-50.0	-50.0	-49.6	-50.0	-47.8	-25.2	-17.2	-16.7	-15.7	-11.6	-7.4	-4.6	-6.5
29/01/2005	-2.5	-4.6	-6.7	-11.7	-27.5	-25.1	-43.9	-50.0	-50.0	-50.0	-50.0	-49.5	-26.5	-19.1	-18.1	-17.1	-13.2	-8.6	-6.3	-7.6
30/01/2005	-2.5	-4.6	-6.2	-10.6	-22.8	-25.5	-44.3	-46.0	-50.0	-49.0	-50.0	-50.0	-27.6	-20.6	-18.3	-18.1	-14.7	-9.6	-7.4	-8.1
31/01/2005	-3.4	-5.5	-8.0	-13.3	-28.8	-26.8	-45.0	-50.0	-50.0	-50.0	-50.0	-50.0	-29.3	-22.2	-20.9	-19.6	-16.1	-11.4	-8.7	-9.8
01/02/2005	-4.2	-6.5	-9.0	-14.4	-29.1	-27.7	-45.9	-50.0	-50.0	-50.0	-50.0	-50.0	-29.6	-22.5	-21.2	-19.8	-16.3	-11.6	-8.9	-10.0
02/02/2005	-5.2	-7.0	-9.5	-14.9	-29.1	-28.2	-46.4	-50.0	-50.0	-50.0	-50.0	-50.0	-28.6	-22.0	-20.2	-18.2	-15.3	-11.1	-8.9	-9.5
03/02/2005	-6.2	-8.0	-10.0	-15.9	-29.1	-29.2	-46.9	-50.0	-50.0	-50.0	-50.0	-50.0	-26.5	-20.5	-18.7	-17.2	-14.3	-10.6	-8.4	-8.9
04/02/2005	-7.2	-9.0	-11.0	-16.9	-29.6	-29.7	-47.4	-50.0	-50.0	-50.0	-50.0	-50.0	-25.0	-19.0	-17.7	-15.7	-13.2	-10.1	-7.9	-8.4
05/02/2005	-8.7	-10.0	-12.1	-17.4	-30.1	-30.2	-47.9	-50.0	-50.0	-50.0	-50.0	-49.3	-23.5	-18.0	-16.7	-14.7	-12.7	-9.6	-7.4	-7.9

06/02/2005	-9.7	-11.1	-13.1	-18.4	-30.1	-30.7	-48.5	-50.0	-50.0	-50.0	-50.0	-48.3	-21.9	-16.9	-15.6	-14.1	-11.7	-9.1	-7.4	-7.4
07/02/2005	-11.3	-12.1	-14.1	-18.9	-30.6	-31.8	-48.5	-50.0	-50.0	-50.0	-50.0	-47.3	-20.9	-16.4	-14.6	-13.1	-11.2	-9.1	-6.8	-7.4
08/02/2005	-11.8	-12.6	-13.6	-17.4	-27.0	-27.7	-40.7	-46.7	-50.0	-47.0	-50.0	-45.7	-20.4	-15.4	-14.1	-12.6	-10.7	-8.6	-6.8	-7.4
09/02/2005	-10.7	-11.1	-11.5	-14.8	-22.9	-23.6	-34.0	-40.0	-50.0	-40.4	-50.0	-41.6	-19.4	-14.4	-13.6	-12.1	-10.7	-8.6	-6.8	-6.9
10/02/2005	-10.2	-10.1	-10.5	-13.3	-20.4	-21.0	-30.4	-35.5	-45.7	-36.3	-45.6	-38.0	-18.9	-13.9	-13.1	-11.6	-10.2	-8.6	-6.8	-6.9
11/02/2005	-9.7	-9.6	-10.0	-12.3	-18.3	-19.5	-27.3	-32.4	-41.5	-33.8	-41.6	-34.4	-18.4	-13.4	-12.6	-11.6	-10.2	-8.1	-6.8	-6.9
12/02/2005	-9.2	-9.6	-9.5	-11.7	-17.3	-17.9	-25.3	-30.4	-38.4	-31.2	-38.5	-32.4	-17.9	-13.4	-12.0	-11.1	-9.7	-8.1	-6.8	-6.9
13/02/2005	-9.1	-9.0	-9.0	-11.0	-16.2	-17.0	-23.5	-28.2	-36.2	-29.3	-36.9	-29.9	-16.9	-12.9	-12.0	-11.1	-9.7	-8.1	-6.8	-6.9
14/02/2005	-9.1	-9.0	-9.0	-10.5	-15.1	-15.9	-22.0	-26.7	-33.6	-27.8	-33.9	-28.3	-16.3	-12.3	-11.5	-10.6	-9.7	-8.1	-6.8	-6.9
15/02/2005	-8.8	-8.7	-8.8	-10.1	-14.4	-14.9	-21.4	-24.4	-29.9	-26.2	-29.7	-26.9	-16.0	-13.1	-11.0	-10.4	-9.3	-8.0	-6.6	-6.6
16/02/2005	-8.4	-8.3	-8.3	-9.6	-13.5	-14.2	-19.2	-23.3	-29.5	-24.5	-28.8	-25.2	-15.3	-14.0	-11.0	-10.2	-9.1	-8.0	-6.6	-6.5
17/02/2005	-8.2	-8.2	-8.2	-9.4	-13.1	-13.8	-18.5	-22.4	-28.3	-23.7	-28.3	-24.0	-14.7	-11.2	-10.8	-9.9	-8.9	-7.9	-6.5	-6.4
18/02/2005	-8.2	-8.2	-8.2	-9.4	-12.6	-13.3	-17.9	-21.4	-27.3	-22.6	-27.3	-22.9	-14.7	-11.2	-10.8	-9.9	-8.9	-7.9	-6.5	-6.4
19/02/2005	-8.2	-8.2	-8.2	-8.9	-12.1	-12.8	-16.9	-20.9	-25.8	-22.1	-26.7	-21.9	-14.2	-11.2	-10.8	-9.9	-8.9	-7.9	-6.5	-6.4
20/02/2005	-8.2	-8.2	-8.2	-8.9	-12.1	-12.8	-16.4	-19.8	-24.8	-21.1	-24.7	-21.4	-13.7	-10.7	-10.8	-9.9	-8.9	-7.9	-6.5	-6.4
21/02/2005	-8.2	-8.2	-7.7	-8.9	-11.5	-12.3	-15.9	-19.3	-24.2	-20.6	-23.7	-20.4	-13.7	-10.7	-10.3	-9.9	-8.9	-7.9	-6.5	-6.4
22/02/2005	-8.2	-8.2	-7.7	-8.4	-11.5	-11.8	-15.4	-18.3	-23.2	-20.1	-23.2	-19.9	-13.7	-10.7	-10.3	-9.4	-8.9	-7.9	-6.5	-6.4
23/02/2005	-7.7	-7.7	-7.7	-8.4	-11.0	-11.8	-14.9	-17.8	-22.2	-19.5	-22.1	-19.4	-13.2	-10.7	-10.3	-9.4	-8.9	-7.9	-6.5	-6.4
24/02/2005	-7.7	-7.7	-7.6	-8.3	-10.8	-11.3	-14.3	-17.2	-21.5	-18.8	-21.6	-18.9	-13.2	-10.7	-10.3	-9.4	-8.9	-7.9	-6.9	-6.5
25/02/2005	-7.8	-7.7	-7.7	-8.2	-10.7	-11.3	-14.3	-17.1	-20.8	-18.7	-20.7	-18.4	-12.9	-10.3	-10.1	-9.4	-8.8	-8.1	-7.0	-6.5
26/02/2005	-7.8	-7.7	-7.7	-8.2	-10.7	-11.3	-13.8	-16.6	-20.3	-18.2	-20.2	-17.9	-12.9	-10.3	-10.1	-9.4	-8.8	-8.1	-7.0	-6.5
27/02/2005	-7.8	-7.7	-7.7	-8.2	-10.2	-10.8	-13.3	-16.1	-19.8	-17.7	-19.7	-17.4	-12.9	-10.3	-10.1	-9.4	-8.8	-8.1	-7.0	-6.5
28/02/2005	-7.8	-7.7	-7.7	-8.2	-10.2	-10.8	-13.3	-15.5	-19.3	-17.2	-19.2	-16.9	-12.4	-10.3	-10.1	-9.4	-8.8	-8.1	-7.0	-6.5
01/03/2005	-7.8	-7.7	-7.7	-8.2	-10.2	-10.8	-13.3	-15.5	-19.3	-17.2	-19.2	-16.4	-12.4	-10.3	-10.1	-9.4	-8.8	-8.1	-7.0	-7.0
02/03/2005	-7.8	-7.7	-7.7	-8.2	-10.2	-10.8	-13.3	-15.5	-18.8	-17.2	-18.6	-16.4	-12.4	-10.3	-10.1	-9.4	-8.8	-8.1	-7.0	-7.0
03/03/2005	-7.8	-7.7	-8.2	-8.2	-10.2	-10.8	-12.8	-15.0	-18.8	-16.6	-18.1	-16.4	-12.4	-10.3	-10.1	-9.4	-8.8	-8.1	-7.0	-7.0
04/03/2005	-8.3	-8.2	-8.2	-8.2	-10.2	-10.8	-12.8	-15.0	-18.3	-16.6	-18.1	-15.8	-12.4	-10.3	-10.1	-9.4	-8.8	-8.6	-7.5	-7.5
05/03/2005	-8.3	-8.2	-8.2	-8.2	-10.2	-10.8	-12.8	-14.5	-17.8	-16.6	-17.6	-15.8	-12.4	-10.3	-10.1	-9.4	-8.8	-8.6	-7.5	-7.5
06/03/2005	-8.3	-8.2	-8.2	-8.2	-10.2	-10.8	-12.8	-14.5	-17.8	-16.1	-17.6	-15.3	-11.9	-10.3	-10.1	-9.4	-8.8	-8.6	-7.5	-7.5
07/03/2005	-8.3	-8.2	-8.2	-8.2	-10.2	-10.8	-12.3	-14.5	-17.3	-16.1	-17.1	-15.3	-11.9	-10.3	-10.1	-9.4	-8.8	-8.6	-7.5	-7.5
08/03/2005	-8.3	-8.2	-8.2	-8.2	-10.2	-10.3	-12.3	-14.0	-16.8	-15.6	-16.6	-14.8	-11.9	-10.3	-10.1	-9.4	-8.8	-8.6	-7.5	-7.5
09/03/2005	-8.3	-8.2	-8.2	-8.2	-10.2	-10.3	-12.3	-14.0	-16.8	-15.6	-16.6	-14.8	-11.9	-9.8	-10.1	-9.4	-8.8	-8.6	-7.5	-7.5
10/03/2005	-8.5	-8.5	-8.5	-8.5	-10.0	-10.2	-11.9	-13.6	-16.4	-15.1	-16.1	-14.4	-11.5	-9.8	-9.9	-9.3	-8.9	-8.6	-7.7	-7.1
11/03/2005	-8.5	-8.5	-8.5	-8.5	-10.0	-10.2	-11.9	-13.6	-16.4	-15.1	-16.1	-14.4	-11.5	-9.8	-9.9	-9.3	-8.9	-8.6	-7.7	-7.1
12/03/2005	-8.5	-8.5	-8.5	-8.5	-10.0	-10.2	-11.9	-13.1	-15.9	-15.1	-15.6	-14.4	-11.5	-9.8	-9.9	-9.3	-8.9	-8.6	-7.7	-7.1

13/03/2005	-8.5	-8.5	-8.5	-8.5	-8.5	-10.0	-10.2	-11.4	-13.1	-15.9	-14.6	-15.6	-13.9	-11.5	-9.8	-9.9	-9.3	-8.9	-8.6	-7.7	-7.1
14/03/2005	-8.5	-8.5	-8.5	-8.5	-8.5	-10.0	-9.7	-11.4	-13.1	-15.4	-14.6	-15.1	-13.9	-11.5	-9.8	-9.9	-9.3	-8.9	-8.6	-7.7	-7.1
15/03/2005	-8.5	-8.5	-8.5	-8.5	-8.5	-9.5	-9.7	-11.4	-12.6	-15.4	-14.1	-15.1	-13.4	-11.0	-9.8	-9.9	-9.3	-8.9	-8.6	-7.7	-7.1
16/03/2005	-8.0	-8.5	-8.5	-8.5	-8.5	-9.5	-9.7	-10.9	-12.6	-14.9	-14.1	-14.6	-13.4	-11.0	-9.8	-9.9	-9.3	-8.9	-8.6	-7.7	-7.1
17/03/2005	-8.0	-8.0	-8.5	-8.0	-9.5	-9.5	-9.7	-10.9	-12.0	-14.9	-14.1	-14.6	-13.4	-11.0	-9.3	-9.9	-8.8	-8.9	-8.6	-7.7	-7.1
18/03/2005	-8.0	-8.0	-7.9	-8.0	-9.5	-9.5	-9.2	-10.9	-12.0	-14.4	-13.6	-14.6	-12.9	-11.0	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-7.1
19/03/2005	-7.5	-8.0	-7.9	-8.0	-9.5	-9.5	-9.2	-10.4	-12.0	-14.4	-13.6	-14.1	-12.9	-11.0	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
20/03/2005	-7.5	-8.0	-7.9	-8.0	-9.5	-9.5	-9.2	-10.4	-12.0	-14.4	-13.6	-14.1	-12.9	-11.0	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
21/03/2005	-7.5	-8.0	-7.9	-8.0	-9.5	-9.5	-9.2	-10.4	-11.5	-14.4	-13.6	-14.1	-12.9	-10.5	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
22/03/2005	-7.5	-8.0	-7.9	-8.0	-9.5	-9.5	-9.2	-10.4	-11.5	-13.9	-13.6	-14.1	-12.4	-10.5	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
23/03/2005	-7.5	-8.0	-7.9	-8.0	-9.0	-9.0	-9.2	-10.4	-11.5	-13.9	-13.1	-13.6	-12.4	-10.5	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
24/03/2005	-7.5	-8.0	-7.9	-8.0	-9.0	-9.0	-9.2	-10.4	-11.5	-13.9	-13.1	-13.6	-12.4	-10.5	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
25/03/2005	-7.5	-8.0	-7.9	-8.0	-9.0	-9.0	-9.2	-10.4	-11.5	-13.9	-13.1	-13.6	-12.4	-10.5	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
26/03/2005	-7.5	-8.0	-7.9	-8.0	-9.0	-9.0	-9.2	-10.4	-11.5	-13.9	-13.1	-13.6	-12.4	-10.5	-9.3	-9.4	-8.8	-8.9	-8.6	-7.7	-6.6
27/03/2005	-7.5	-8.0	-7.9	-8.0	-9.0	-9.0	-9.2	-10.4	-11.5	-13.9	-13.1	-13.6	-12.4	-10.5	-9.3	-9.4	-8.8	-8.4	-8.6	-7.7	-6.6
28/03/2005	-7.5	-8.0	-7.9	-8.0	-9.0	-9.0	-9.2	-10.4	-11.5	-13.9	-13.1	-13.6	-12.4	-10.5	-9.3	-9.4	-8.8	-8.4	-8.6	-7.7	-6.6
29/03/2005	-7.8	-8.1	-8.2	-7.8	-8.9	-8.9	-8.9	-10.1	-11.2	-13.5	-12.9	-13.2	-12.1	-10.2	-9.0	-9.2	-8.7	-8.4	-8.6	-8.0	-7.0
30/03/2005	-7.8	-8.1	-8.2	-7.8	-8.9	-8.9	-8.9	-10.1	-11.2	-13.5	-12.9	-13.2	-12.1	-10.2	-9.0	-9.2	-8.7	-8.4	-8.6	-8.0	-7.5
31/03/2005	-7.8	-8.1	-8.2	-7.8	-8.9	-8.9	-8.9	-10.1	-11.2	-13.5	-12.9	-13.2	-12.1	-10.2	-9.0	-9.2	-8.7	-8.4	-8.6	-8.0	-8.0
01/04/2005	-7.8	-8.1	-8.2	-7.8	-8.9	-8.9	-8.9	-10.1	-11.2	-13.5	-12.9	-13.2	-12.1	-10.2	-9.0	-9.2	-8.7	-8.4	-8.6	-8.0	-8.5
02/04/2005	-8.3	-8.1	-8.2	-7.8	-8.9	-8.9	-8.9	-10.1	-10.7	-13.5	-12.9	-13.2	-12.1	-10.2	-9.0	-9.2	-8.7	-8.4	-8.6	-8.0	-8.5
03/04/2005	-8.3	-8.1	-8.2	-7.8	-8.9	-8.9	-8.9	-9.5	-10.7	-13.5	-12.9	-12.9	-11.9	-10.2	-9.1	-9.2	-8.8	-8.5	-8.6	-8.0	-8.9
04/04/2005	-7.8	-8.1	-8.2	-7.8	-8.4	-8.9	-8.9	-9.5	-10.7	-13.0	-12.9	-12.9	-11.9	-10.2	-9.1	-9.2	-8.8	-8.5	-8.6	-8.0	-8.9
05/04/2005	-7.8	-8.1	-8.2	-7.8	-8.4	-8.4	-8.4	-9.5	-10.7	-13.0	-12.9	-12.9	-11.9	-10.2	-9.1	-9.2	-8.8	-8.5	-8.6	-8.0	-8.9

Table C.5 Temperature measurements of Gauge T5 at Shaft A and Gauge T1 at Shaft T

	10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
	A-D2-T5-10	A-D2-T5-09	A-D2-T5-08	A-D2-T5-07	A-D2-T5-06	A-D2-T5-05	A-D2-T5-04	A-D2-T5-03	A-D2-T5-02	A-D2-T5-01	T-D2-T1-01	T-D2-T1-02	T-D2-T1-03	T-D2-T1-04	T-D2-T1-05	T-D2-T1-06	T-D2-T1-07	T-D2-T1-08	T-D2-T1-09	T-D2-T1-10
	0.75	0.65	0.55	0.45	0.40	0.35	0.43	0.52	0.60	0.20	0.38	0.40	0.41	0.43	0.40	0.52	0.60	0.58	0.56	0.55
10/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.8	10.8	10.9	11.5	11.2	11.4	11.6	11.9	12.7	12.8
11/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.0	10.5	10.6	11.1	11.2	11.3	11.6	11.9	12.3	12.4
12/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	7.9	8.5	8.7	9.2	9.2	9.5	9.9	10.3	11.0	10.8
13/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	6.3	6.6	7.1	7.6	7.5	7.8	8.2	8.7	9.6	9.2
14/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	4.5	5.3	5.5	6.0	5.8	6.1	6.6	7.1	8.2	7.7
15/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	2.8	2.6	4.3	4.2	4.2	4.4	4.5	5.6	7.0	6.1
16/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	1.5	2.0	2.8	2.6	2.5	2.7	2.9	4.0	5.7	4.5
17/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	0.6	1.4	1.7	1.5	1.5	1.7	2.2	2.7	4.4	3.3
18/01/2005	1.0	0.4	0.5	-1.2	-1.4	0.4	2.3	-3.3	-9.8	-1.2	-0.4	0.3	0.5	0.8	0.5	0.7	1.1	0.9	2.7	1.6
19/01/2005	0.3	-0.3	-1	-2	-2.1	-0.8	1.2	-2.3	-14.2	-2.4	-1.5	-0.7	-0.2	0.1	-0.1	0.0	0.1	0.3	1.8	0.9
20/01/2005	-0.2	-0.8	-1.5	-3.0	-3.1	-1.3	0.2	1.7	-17.3	-6.0	-3.1	-1.7	-0.7	-0.5	-0.1	0.0	0.1	-0.2	1.3	0.4
21/01/2005	-0.9	-0.9	-1.7	-2.9	-3.2	-1.6	-0.3	0.9	-17.9	-8.5	-4.0	-3.0	-1.3	-0.3	-0.4	-0.4	-0.2	-0.3	0.5	0.2
22/01/2005	-1.9	-1.8	-2.8	-4.0	-4.2	-2.7	-1.0	0.0	-21.5	-11.7	-6.6	-5.5	-2.4	-1.3	-1.4	-0.4	-0.2	-0.8	0.5	-0.3
23/01/2005	-2.3	-2.8	-3.9	-5.1	-5.0	-3.6	-1.7	-0.8	-24.5	-15.7	-9.2	-8.6	-5.5	-2.9	-2.6	-0.9	-0.7	-1.3	0.0	-0.8
24/01/2005	-2.5	-3.7	-4.8	-6.1	-5.9	-4.6	-2.4	-1.3	-27.6	-18.6	-11.8	-11.7	-9.1	-6.9	-6.7	-2.5	-0.7	-1.3	-0.6	-0.8
25/01/2005	-3.3	-4.5	-5.4	-6.8	-6.8	-5.2	-3.0	-2.1	-28.5	-20.1	-13.4	-13.9	-11.3	-10.1	-10.0	-6.8	-2.6	-1.0	-0.8	-1.0
26/01/2005	-5.3	-6.2	-6.5	-7.6	-7.4	-5.8	-3.6	-3.2	-29.9	-22.0	-15.9	-15.4	-13.9	-12.9	-13.0	-9.9	-6.4	-4.8	-0.9	-1.1
27/01/2005	-7.3	-7.7	-8.1	-9.1	-8.4	-6.8	-4.6	-4.2	-30.5	-23.0	-16.8	-17.4	-16.0	-15.0	-15.0	-12.5	-9.5	-7.9	-1.4	-5.3
28/01/2005	-8.3	-9.2	-9.1	-10.2	-9.5	-7.9	-5.7	-5.7	-31.0	-23.5	-17.9	-18.5	-16.0	-16.1	-14.0	-11.0	-9.4	-8.6	-2.4	-7.4
29/01/2005	-9.8	-10.5	-10.6	-11.8	-11.0	-9.4	-6.6	-7.0	-31.8	-24.6	-19.1	-19.6	-17.5	-17.3	-15.3	-12.4	-11.0	-8.9	-3.5	-8.5
30/01/2005	-11.4	-12.1	-12.1	-12.8	-12.0	-10.4	-8.2	-8.5	-32.9	-25.6	-20.3	-20.7	-19.0	-18.5	-16.6	-13.8	-12.6	-9.3	-5.0	-10.0
31/01/2005	-12.6	-13.3	-13.3	-14.3	-13.2	-11.7	-9.5	-10.4	-33.4	-26.6	-21.8	-22.2	-20.8	-19.8	-20.1	-18.1	-15.7	-14.7	-9.8	-12.5
01/02/2005	-13.9	-14.6	-14.5	-15.5	-14.0	-13.0	-10.3	-11.7	-34.2	-27.3	-22.6	-23.0	-21.5	-20.5	-20.8	-18.8	-16.5	-15.9	-11.2	-13.8
02/02/2005	-14.4	-15.1	-15.0	-16.0	-15.1	-13.5	-11.4	-12.7	-34.2	-27.3	-23.7	-24.0	-22.0	-21.0	-21.3	-19.3	-17.5	-16.5	-12.3	-14.8
03/02/2005	-15.5	-16.2	-16.1	-17.0	-15.6	-14.5	-12.4	-13.8	-33.7	-27.3	-23.7	-24.5	-22.5	-21.5	-21.3	-19.9	-17.5	-17.0	-13.3	-15.4
04/02/2005	-16.0	-16.7	-16.6	-17.5	-16.6	-15.0	-13.4	-14.8	-33.2	-27.3	-24.2	-24.5	-22.5	-21.5	-21.3	-19.9	-18.0	-17.5	-13.8	-15.9
05/02/2005	-16.5	-17.2	-17.1	-18.0	-17.1	-15.5	-13.9	-15.3	-33.2	-27.3	-24.7	-25.0	-22.5	-21.5	-21.3	-20.4	-18.0	-17.5	-14.3	-16.4
06/02/2005	-17.0	-17.7	-17.6	-18.6	-17.6	-16.6	-14.5	-16.3	-33.2	-27.3	-24.7	-25.0	-22.5	-21.5	-21.3	-20.4	-18.5	-18.0	-14.9	-16.4
07/02/2005	-17.5	-18.2	-18.1	-19.1	-18.1	-17.1	-15.5	-16.8	-32.7	-26.8	-25.2	-25.0	-22.5	-21.5	-21.8	-20.4	-18.5	-18.0	-15.4	-16.9
08/02/2005	-18.0	-18.2	-18.6	-19.6	-18.6	-17.1	-16.0	-17.4	-32.7	-26.8	-25.2	-25.6	-23.0	-21.5	-21.8	-20.9	-19.0	-18.5	-15.9	-17.4

09/02/2005	-18.0	-18.7	-19.1	-19.6	-19.1	-17.6	-16.5	-17.9	-32.7	-26.8	-25.7	-25.6	-23.0	-22.1	-21.8	-20.9	-19.0	-18.5	-16.4	-17.4
10/02/2005	-18.5	-18.7	-19.1	-19.6	-19.1	-18.2	-17.0	-18.4	-32.7	-26.8	-26.7	-26.1	-23.0	-22.1	-21.8	-20.9	-19.5	-19.0	-16.4	-17.9
11/02/2005	-18.5	-19.2	-19.1	-20.1	-19.6	-18.2	-17.0	-18.9	-32.7	-26.8	-26.2	-26.1	-23.0	-22.1	-22.3	-21.4	-20.0	-19.0	-16.9	-17.9
12/02/2005	-19.0	-19.2	-19.6	-20.1	-19.6	-18.7	-17.5	-18.9	-32.7	-26.8	-26.2	-26.1	-23.5	-22.1	-22.3	-21.4	-20.0	-19.5	-17.5	-18.4
13/02/2005	-19.2	-19.6	-19.9	-20.5	-19.9	-19.0	-17.9	-19.4	-32.7	-27.0	-26.7	-26.1	-23.5	-22.6	-22.3	-21.4	-20.6	-19.5	-17.5	-18.9
14/02/2005	-19.2	-19.6	-19.9	-20.5	-19.9	-19.0	-17.9	-19.4	-32.7	-27.0	-26.7	-26.6	-23.5	-22.6	-22.8	-21.9	-20.6	-20.0	-18.0	-18.9
15/02/2005	-19.4	-19.8	-20.0	-20.6	-20.2	-19.3	-18.2	-19.8	-32.8	-27.1	-26.8	-26.7	-24.0	-22.8	-23.0	-22.0	-20.8	-20.4	-18.4	-19.2
16/02/2005	-19.6	-19.9	-20.3	-20.8	-20.5	-19.5	-18.5	-20.0	-32.9	-27.4	-27.0	-26.8	-24.2	-23.0	-23.2	-22.3	-21.0	-20.8	-18.7	-19.5
17/02/2005	-19.7	-20.0	-20.3	-20.8	-20.5	-19.4	-18.7	-20.0	-32.8	-27.4	-27.5	-27.0	-24.4	-23.4	-23.3	-22.6	-21.2	-20.8	-18.8	-19.9
18/02/2005	-19.7	-20.0	-20.3	-20.8	-20.5	-19.4	-18.7	-20.0	-32.8	-27.4	-27.4	-27.0	-24.4	-23.4	-23.3	-22.6	-21.2	-20.8	-18.9	-19.9
19/02/2005	-19.7	-20.0	-20.3	-20.8	-20.5	-19.4	-18.7	-20.0	-32.8	-27.4	-27.4	-27.0	-24.4	-23.4	-23.3	-22.6	-21.2	-21.3	-19.4	-20.4
20/02/2005	-19.7	-20.0	-20.3	-20.8	-20.5	-19.4	-18.7	-20.0	-32.8	-27.4	-27.4	-27.5	-24.9	-23.9	-23.9	-23.2	-21.7	-21.3	-19.4	-20.4
21/02/2005	-19.7	-20.0	-20.3	-20.8	-20.5	-19.4	-18.7	-20.0	-32.8	-27.4	-27.4	-27.5	-24.9	-23.9	-23.9	-23.2	-21.7	-21.3	-19.9	-20.9
22/02/2005	-19.7	-20.0	-20.3	-20.8	-20.5	-19.4	-18.7	-20.0	-32.8	-27.4	-27.9	-27.5	-24.9	-23.9	-23.9	-23.2	-21.7	-21.8	-19.9	-20.9
23/02/2005	-19.7	-20.0	-20.3	-20.8	-20.5	-19.4	-18.7	-20.0	-32.8	-27.4	-27.9	-27.5	-25.4	-24.4	-23.9	-23.7	-21.7	-21.8	-19.9	-20.9
24/02/2005	-19.6	-19.9	-20.3	-20.7	-20.6	-19.6	-19.1	-20.4	-32.4	-27.7	-27.8	-27.7	-25.4	-24.5	-24.3	-23.7	-22.2	-22.0	-20.3	-21.3
25/02/2005	-19.6	-19.9	-20.4	-20.7	-20.6	-19.7	-19.1	-20.4	-31.8	-27.7	-27.9	-27.8	-25.5	-24.4	-24.3	-23.7	-22.2	-22.0	-20.4	-21.4
26/02/2005	-19.6	-19.9	-20.4	-20.7	-20.6	-19.7	-19.1	-20.4	-31.8	-27.2	-27.9	-27.8	-25.5	-24.4	-24.3	-23.7	-22.2	-22.0	-20.4	-21.4
27/02/2005	-19.6	-19.9	-20.4	-20.7	-21.2	-20.3	-19.1	-20.4	-32.3	-27.7	-27.9	-27.8	-25.5	-24.4	-24.3	-23.7	-22.2	-22.0	-20.4	-21.4
28/02/2005	-20.1	-20.5	-20.9	-21.2	-21.2	-20.3	-19.6	-20.9	-32.8	-27.7	-27.9	-27.8	-25.5	-24.4	-24.3	-23.7	-22.2	-22.0	-20.9	-21.9
01/03/2005	-20.1	-20.5	-20.9	-21.2	-21.2	-20.3	-19.6	-20.9	-32.8	-28.2	-28.4	-28.3	-26.0	-24.9	-24.8	-24.2	-22.7	-22.5	-20.9	-21.9
02/03/2005	-20.1	-20.4	-20.9	-21.2	-21.2	-20.3	-19.6	-20.9	-32.8	-28.2	-28.4	-28.3	-26.0	-24.9	-24.8	-24.2	-22.7	-22.5	-20.9	-21.9
03/03/2005	-19.6	-19.9	-20.4	-20.7	-20.7	-19.8	-19.6	-20.9	-31.3	-27.7	-27.9	-27.8	-26.0	-24.9	-24.8	-24.2	-22.7	-22.5	-21.4	-21.9
04/03/2005	-19.6	-19.9	-20.4	-20.7	-20.7	-19.8	-19.6	-20.9	-29.7	-26.6	-27.4	-27.2	-24.9	-24.4	-23.8	-23.7	-22.2	-22.0	-20.4	-21.4
05/03/2005	-19.6	-19.4	-19.9	-20.2	-20.2	-19.8	-19.1	-20.4	-29.2	-26.1	-26.9	-26.7	-24.4	-23.8	-23.3	-23.2	-21.7	-21.5	-20.4	-20.9
06/03/2005	-19.1	-19.4	-19.9	-20.2	-20.2	-19.2	-19.1	-20.4	-28.7	-25.6	-26.3	-26.2	-24.4	-23.3	-23.3	-22.7	-21.7	-21.0	-19.9	-20.9
07/03/2005	-19.1	-19.4	-19.9	-20.2	-20.2	-19.2	-19.1	-20.4	-28.7	-25.6	-25.8	-25.7	-23.9	-23.3	-22.8	-22.7	-21.2	-21.0	-19.9	-20.3
08/03/2005	-19.1	-19.4	-19.9	-20.2	-20.2	-19.2	-19.1	-20.4	-28.2	-25.1	-25.8	-25.7	-23.9	-22.8	-22.8	-22.2	-21.2	-20.5	-19.4	-20.3
09/03/2005	-18.6	-18.9	-19.4	-19.7	-19.6	-19.2	-19.1	-19.9	-27.7	-24.6	-25.3	-24.6	-23.4	-22.3	-22.3	-21.7	-20.7	-20.0	-18.9	-19.8
10/03/2005	-18.6	-19.0	-19.4	-19.7	-19.8	-19.1	-18.8	-19.9	-27.2	-24.2	-24.9	-24.6	-22.9	-21.9	-21.7	-21.4	-20.1	-19.9	-18.7	-19.4
11/03/2005	-18.6	-19.0	-19.4	-19.7	-19.8	-19.1	-18.8	-19.9	-27.2	-24.2	-24.9	-24.6	-22.9	-21.9	-21.7	-21.4	-20.1	-19.9	-18.7	-19.4
12/03/2005	-18.6	-19.0	-19.4	-19.7	-19.8	-19.1	-18.8	-19.9	-26.7	-23.6	-24.9	-24.1	-22.9	-21.9	-21.7	-20.9	-20.1	-19.9	-18.2	-19.4
13/03/2005	-18.1	-19.0	-19.4	-19.7	-19.8	-19.1	-18.8	-19.9	-26.7	-23.6	-24.4	-24.1	-22.4	-21.3	-21.2	-20.9	-19.6	-19.9	-18.2	-18.9
14/03/2005	-17.6	-18.5	-19.4	-19.7	-19.8	-19.1	-18.8	-19.4	-26.7	-23.6	-24.4	-24.1	-22.4	-21.3	-21.2	-20.9	-19.6	-19.4	-18.2	-18.9
15/03/2005	-16.6	-17.4	-18.9	-19.2	-19.3	-18.6	-18.3	-19.4	-26.2	-23.1	-24.4	-23.6	-22.4	-21.3	-21.2	-20.9	-19.6	-19.4	-18.2	-18.9
16/03/2005	-16.1	-16.9	-18.4	-19.2	-19.3	-18.6	-18.3	-19.4	-26.7	-23.1	-23.9	-23.6	-21.9	-20.8	-20.7	-20.4	-19.1	-19.4	-18.2	-18.9
17/03/2005	-15.6	-16.4	-17.9	-19.2	-19.3	-18.6	-18.3	-19.4	-26.2	-23.1	-23.9	-23.6	-21.9	-20.8	-20.7	-20.4	-19.1	-19.4	-17.7	-18.9
18/03/2005	-15.6	-15.9	-16.9	-18.2	-19.3	-18.6	-18.3	-19.4	-26.2	-23.1	-23.9	-23.6	-21.9	-20.8	-20.7	-20.4	-19.1	-19.4	-17.7	-18.9
19/03/2005	-15.6	-15.9	-16.4	-16.7	-18.7	-18.6	-18.3	-19.4	-26.8	-23.6	-24.4	-23.6	-21.9	-21.4	-20.7	-20.9	-19.6	-19.4	-18.2	-18.9

20/03/2005	-15.6	-15.9	-15.8	-15.6	-16.7	-19.1	-18.3	-19.4	-27.3	-23.6	-24.4	-24.1	-22.4	-21.4	-21.2	-20.9	-19.6	-19.4	-18.2	-18.9
21/03/2005	-15.6	-15.4	-15.3	-14.6	-15.7	-17.1	-18.8	-19.4	-27.3	-23.6	-24.4	-24.1	-22.4	-21.4	-21.2	-20.9	-19.6	-19.4	-18.2	-19.4
22/03/2005	-15.6	-15.4	-15.3	-14.6	-14.7	-15.5	-15.7	-19.9	-27.8	-24.1	-24.9	-24.1	-22.4	-21.9	-21.7	-21.4	-20.1	-19.9	-18.7	-19.4
23/03/2005	-16.1	-15.9	-15.3	-14.1	-14.2	-14.5	-13.6	-18.9	-27.8	-24.1	-25.4	-24.6	-22.9	-22.4	-21.7	-21.9	-20.6	-19.9	-19.2	-19.9
24/03/2005	-16.1	-15.9	-15.3	-14.1	-14.2	-14.0	-12.1	-15.3	-27.8	-24.1	-25.4	-25.1	-23.5	-22.4	-22.2	-21.9	-21.1	-20.4	-19.2	-20.4
25/03/2005	-16.6	-15.9	-15.3	-14.1	-14.2	-12.9	-11.0	-13.8	-27.8	-24.1	-25.9	-25.1	-23.5	-22.4	-22.2	-21.9	-21.1	-20.4	-19.7	-20.4
26/03/2005	-16.6	-16.4	-15.3	-14.6	-14.2	-12.9	-10.5	-13.3	-27.8	-24.6	-25.4	-25.1	-23.5	-22.4	-22.2	-22.4	-21.1	-20.9	-19.7	-20.4
27/03/2005	-16.6	-16.4	-15.8	-14.6	-14.2	-12.9	-10.5	-13.3	-27.8	-25.1	-25.4	-25.6	-23.5	-22.9	-22.7	-22.4	-21.1	-20.9	-19.7	-20.9
28/03/2005	-17.1	-16.9	-15.8	-15.1	-14.7	-12.9	-10.5	-13.3	-27.8	-25.1	-25.4	-25.6	-24.0	-22.9	-22.7	-22.4	-21.1	-21.4	-19.7	-20.9
29/03/2005	-17.4	-17.2	-16.4	-15.6	-15.0	-13.4	-11.2	-13.9	-28.3	-25.5	-25.7	-26.0	-24.1	-23.2	-23.0	-22.7	-21.6	-21.5	-20.2	-21.2
30/03/2005	-17.4	-17.2	-16.9	-16.1	-15.5	-13.9	-11.7	-12.9	-17.7	-25.5	-24.2	-26.0	-24.1	-23.2	-23.0	-22.7	-21.6	-21.5	-20.2	-21.2
31/03/2005	-17.9	-17.7	-16.9	-16.6	-15.5	-13.9	-12.2	-11.3	-17.7	-20.3	-19.9	-26.0	-24.6	-23.7	-23.5	-23.2	-22.1	-21.5	-20.8	-21.7
01/04/2005	-17.9	-17.7	-17.4	-16.6	-15.5	-13.9	-12.2	-10.8	-17.2	-9.3	-15.9	-20.8	-24.6	-23.7	-23.5	-23.2	-22.1	-21.5	-20.8	-21.7
02/04/2005	-17.9	-18.2	-17.4	-17.1	-16.0	-14.5	-12.2	-10.3	-18.8	-9.8	-14.3	-17.8	-23.1	-23.7	-23.5	-23.2	-22.1	-22.0	-20.8	-21.7
03/04/2005	-18.5	-18.2	-17.9	-17.1	-16.0	-14.5	-12.7	-10.3	-20.3	-9.8	-14.3	-15.7	-18.0	-23.7	-23.5	-23.2	-22.1	-22.0	-21.3	-21.7
04/04/2005	-18.5	-18.2	-17.9	-17.7	-16.0	-14.5	-12.7	-10.3	-20.8	-9.8	-14.3	-15.2	-15.4	-22.2	-23.5	-23.2	-22.1	-22.0	-21.3	-21.7
05/04/2005	-18.5	-18.2	-17.9	-17.7	-16.5	-14.5	-12.7	-10.3	-21.3	-10.8	-14.3	-15.2	-14.4	-19.1	-23.5	-23.2	-22.1	-22.0	-21.3	-21.7

Table C.6 Temperature measurements of Gauge T6 at Shaft A and Gauge T8 at Shaft T

	10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
	A-D2-T6-10	A-D2-T6-09	A-D2-T6-08	A-D2-T6-07	A-D2-T6-06	A-D2-T6-05	A-D2-T6-04	A-D2-T6-03	A-D2-T6-02	A-D2-T6-01	T-D2-T8-01	T-D2-T8-02	T-D2-T8-03	T-D2-T8-04	T-D2-T8-05	T-D2-T8-06	T-D2-T8-07	T-D2-T8-08	T-D2-T8-09	T-D2-T8-10
	0.75	0.71	0.68	0.65	0.63	0.60	0.60	0.60	0.60	0.60	0.40	0.90	0.88	0.86	0.85	0.85	0.85	0.85	0.85	0.85
10/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.4	10.7	10.6?		10.6	11.1	11.6	12.3	12.3	12.4
11/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.6	10.8	10.8?		10.9	11.2	11.5	12.2	12.6	12.3
12/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.4	10.7	10.6?		10.6	11.0	11.3	11.9	12.3	12.0
13/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	10.0	10.3	10.2?		10.2	10.6	10.8	11.5	11.8	11.6
14/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	9.6	9.9	9.8?		9.8	10.2	10.3	11.0	11.3	11.1
15/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	9.0	9.3	9.6?		9.2	9.7	9.8	10.4	10.7	10.6
16/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	8.5	8.8	8.7?		8.8	9.3	9.3	9.9	10.3	10.1
17/01/2005	12.0	12.8	11.7	11.7	11.4	11.2	11.0	10.9	6.1	6.4	8.0	8.3	8.2?		8.3	8.7	8.8	9.4	9.8	9.5
18/01/2005	12.0	12.8	11.7	11.5	11.2	11.1	10.8	11.0	5.2	5.8	7.0	7.7	7.5?		7.6	7.8	8.1	8.4	8.8	8.5
19/01/2005	12.0	12.8	11.8	11.5	11.2	11.1	10.9	11.0	4.3	4.8	6.6	7.0	7.0?		7.0	7.3	7.4	7.9	8.1	7.6
20/01/2005	12.0	12.8	11.8	11.5	11.2	11.1	10.9	11.0	3.8	4.3	6.1	6.5	6.5?		6.4	6.7	6.8	7.4	7.6	6.6
21/01/2005	12.0	12.8	11.7	11.5	11.1	11.1	10.9	11.0	3.1	3.7	5.2	6.0	5.9?		6.4	6.2	6.3	6.6	7.0	6.1
22/01/2005	9.9	11.2	9.6	9.6	9.3	9.2	9.1	9.2	2.2	2.4	3.6	3.9	5.4?		5.4	5.7	5.7	6.6	6.5	5.6
23/01/2005	7.8	9.8	7.6	7.5	7.2	7.0	6.9	7.1	1.3	1.5	2.6	2.3	4.9?		4.9	5.2	5.2	6.1	6.0	5.1
24/01/2005	5.6	6.3	5.5	5.2	5.0	4.7	4.2	4.4	0.3	0.3	2.0	0.8	4.3?		4.4	4.7	4.7	5.1	5.5	4.6
25/01/2005	4.3	4.9	4.1	3.8	3.6	3.4	2.9	3.0	-0.4	-0.3	0.8	-0.6	4.3?		4.3	4.6	4.2	5.1	5.2	4.6
26/01/2005	3.0	3.2	2.4	2.6	2.5	2.4	1.7	1.9	-1.6	-0.5	0.0	-1.7	4.0?		3.9	4.2	3.7	4.1	4.3	3.8
27/01/2005	1.5	2.1	1.4	1.1	1.0	1.4	0.7	0.9	-4.2	-2.5	-1.1	-3.3	3.5?		3.4	3.7	3.2	3.6	3.8	3.3
28/01/2005	1.0	1.1	0.9	0.6	0.4	0.3	0.2	0.4	-5.7	-3.5	-2.1	-4.3	3.0?		3.0	3.2	3.2	3.6	3.8	3.3
29/01/2005	0.1	0.3	0.3	0.4	0.3	0.2	0.7	-0.6	-7.2	-5.2	-3.0	-5.5	2.5?		2.5	2.6	2.7	3.1	3.3	2.8
30/01/2005	0.1	0.3	-0.2	-0.1	-0.2	-0.3	-1.2	-1.1	-8.7	-6.3	-4.0	-6.8	2.1?		2.1	2.2	2.3	2.6	2.8	2.3
31/01/2005	-0.4	-0.3	-0.5	-0.6	-0.9	-1.1	-1.8	-1.9	-10.6	-7.8	-5.4	-8.4	1.7?		1.7	1.9	1.9	2.1	2.2	1.8
01/02/2005	-0.4	-0.2	-0.6	-0.7	-1.0	-1.7	-2.5	-2.5	-11.9	-9.1	-6.1	-9.1	1.7?		1.6	1.8	2.0	2.0	2.0	1.7
02/02/2005	-0.9	-0.2	-1.2	-1.2	-1.5	-2.3	-3.0	-3.0	-12.9	-9.6	-7.2	-10.7	1.2?		1.1	1.3	1.5	1.5	1.5	1.2
03/02/2005	-1.4	-1.3	-1.7	-1.7	-2.0	-2.3	-3.5	-3.6	-13.9	-10.6	-8.2	-11.7	1.2?		1.1	1.3	1.0	1.5	1.5	1.2
04/02/2005	-2.4	-2.3	-2.7	-2.7	-3.0	-3.3	-4.0	-4.1	-14.9	-11.7	-8.7	-12.2	0.6?		0.6	0.8	1.0	1.0	1.0	0.7
05/02/2005	-3.9	-3.4	-3.7	-3.7	-4.0	-4.3	-4.5	-4.6	-15.4	-12.2	-9.7	-12.7	0.1?		0.6	0.8	0.5	0.5	0.5	0.2

06/02/2005	-5.0	-4.4	-4.7	-4.8	-5.1	-4.8	-5.5	-5.6	-16.5	-12.7	-10.2	-13.7	0.1?		0.1	0.3	-0.1	0.5	0.5	0.2
07/02/2005	-6.0	-5.4	-5.7	-5.8	-5.6	-5.8	-6.5	-6.1	-17.0	-13.2	-11.3	-14.2	-0.4?		0.1	0.3	-0.1	0.0	0.0	-0.3
08/02/2005	-7.0	-5.9	-6.8	-6.8	-6.7	-6.4	-7.1	-7.1	-17.5	-14.3	-11.8	-14.7	-0.4?		-0.4	-0.2	-0.6	-0.5	-0.5	-0.8
09/02/2005	-7.5	-6.9	-7.3	-7.3	-7.7	-7.4	-8.1	-7.6	-18.0	-14.8	-12.3	-15.2	-0.9?		-0.9	-0.7	-0.6	-0.5	-0.5	-1.4
10/02/2005	-8.5	-7.9	-8.3	-8.3	-8.2	-7.9	-8.6	-8.6	-18.5	-14.8	-12.8	-15.7	-1.4?		-0.9	-0.7	-1.2	-1.0	-1.0	-1.4
11/02/2005	-9.0	-8.5	-8.8	-8.8	-8.7	-8.9	-9.1	-9.1	-19.0	-15.3	-13.3	-16.2	-1.9?		-1.4	-1.2	-1.8	-1.0	-1.0	-1.9
12/02/2005	-9.5	-9.0	-9.3	-9.3	-9.2	-9.4	-9.6	-9.6	-19.0	-15.8	-13.8	-16.7	-1.9?		-1.9	-1.7	-1.8	-1.6	-1.5	-2.4
13/02/2005	-10.4	-9.7	-10.2	-10.1	-10.0	-9.9	-10.5	-10.3	-19.6	-16.6	-13.8	-16.7	-2.4?		-2.5	-1.7	-2.3	-2.1	-2.1	-2.9
14/02/2005	-10.9	-10.2	-10.7	-10.6	-10.5	-10.4	-11.0	-10.8	-20.1	-16.6	-14.3	-17.2	-2.9?		-2.5	-2.2	-2.8	-2.6	-2.6	-2.9
15/02/2005	-11.3	-10.9	-11.4	-11.1	-11.2	-11.1	-11.2	-11.3	-20.4	-16.7	-14.7	-17.7	-3.2	0.0	-3.3	-2.3	-2.9	-2.9	-2.9	-3.0
16/02/2005	-12.1	-11.4	-11.8	-11.7	-11.7	-11.5	-11.5	-11.8	-20.7	-16.7	-15.0	-18.0	-4.0	-1.0	-3.7	-2.7	-3.3	-3.4	-3.3	-3.4
17/02/2005	-12.4	-11.7	-12.2	-12.1	-11.9	-11.8	-12.3	-11.9	-20.7	-17.6	-15.5	-18.3	-4.4	-1.5	-3.9	-3.5	-3.8	-3.7	-3.7	-4.4
18/02/2005	-12.4	-11.7	-12.2	-12.1	-11.9	-11.8	-12.3	-11.9	-20.7	-17.6	-15.5	-18.3	-4.5	-2.7	-4.0	-3.6	-4.3	-3.7	-3.7	-4.4
19/02/2005	-12.9	-12.2	-12.7	-12.6	-12.5	-12.3	-12.3	-12.5	-20.7	-17.6	-15.5	-18.3	-5.0	-3.2	-4.5	-4.1	-4.3	-4.2	-4.2	-4.9
20/02/2005	-12.9	-12.2	-12.7	-12.6	-12.5	-12.3	-12.8	-12.5	-20.7	-18.1	-16.0	-18.3	-5.5	-3.7	-5.0	-4.5	-4.8	-4.7	-4.7	-5.4
21/02/2005	-13.4	-12.7	-13.2	-13.1	-13.0	-12.8	-13.3	-13.0	-21.2	-18.1	-16.0	-18.8	-6.0	-4.2	-5.0	-5.0	-4.8	-5.2	-5.2	-5.9
22/02/2005	-13.4	-12.7	-13.2	-13.1	-13.0	-12.8	-13.3	-13.0	-21.2	-18.1	-16.0	-18.8	-6.5	-4.2	-5.5	-5.0	-5.4	-5.2	-5.2	-5.9
23/02/2005	-13.9	-13.2	-13.7	-13.6	-13.5	-13.3	-13.3	-13.0	-21.2	-18.6	-16.6	-18.8	-6.5	-4.7	-6.0	-5.5	-5.9	-5.7	-5.8	-6.4
24/02/2005	-14.1	-13.4	-13.9	-13.8	-13.7	-13.4	-13.9	-13.5	-21.6	-18.8	-16.8	-19.2	-7.1	-5.4	-6.4	-6.1	-6.1	-6.0	-6.1	-6.8
25/02/2005	-14.1	-13.5	-13.9	-13.8	-13.8	-13.5	-14.0	-13.6	-21.6	-18.8	-16.8	-19.2	-7.2	-5.5	-6.5	-6.1	-6.2	-6.1	-6.2	-6.9
26/02/2005	-14.1	-13.5	-13.9	-13.8	-13.8	-13.5	-14.0	-13.6	-21.6	-18.8	-16.8	-19.2	-7.7	-5.5	-7.0	-6.6	-6.7	-6.7	-6.7	-7.4
27/02/2005	-14.6	-14.0	-14.4	-14.4	-14.3	-14.0	-14.5	-14.1	-21.6	-19.3	-17.3	-19.2	-7.7	-5.5	-7.0	-6.6	-6.7	-6.7	-6.7	-7.4
28/02/2005	-15.2	-14.5	-14.9	-14.9	-14.8	-14.5	-14.5	-14.6	-22.1	-19.3	-17.3	-19.7	-8.2	-6.0	-7.5	-7.1	-7.3	-7.2	-7.2	-7.9
01/03/2005	-15.2	-14.5	-14.9	-14.9	-14.8	-14.5	-15.0	-14.6	-22.1	-19.8	-17.3	-19.7	-8.2	-6.0	-7.5	-7.1	-7.8	-7.2	-7.2	-7.9
02/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-22.1	-19.7	-17.8	-19.7	-8.7	-6.5	-8.0	-7.6	-7.8	-7.7	-7.7	-8.4
03/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-22.1	-19.7	-17.8	-19.7	-8.7	-6.5	-8.0	-7.6	-8.3	-7.7	-7.7	-8.4
04/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-21.6	-19.2	-17.8	-19.7	-9.2	-6.5	-8.5	-8.1	-8.3	-8.2	-7.7	-8.4
05/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-21.6	-19.2	-17.3	-19.2	-9.2	-6.5	-8.5	-8.1	-8.3	-8.2	-8.2	-8.4
06/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-21.1	-18.7	-17.3	-19.2	-9.2	-6.5	-8.5	-8.1	-8.3	-8.2	-8.2	-8.9
07/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-21.1	-18.7	-17.3	-18.7	-9.2	-6.5	-8.5	-8.1	-8.3	-8.2	-8.2	-8.9
08/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-21.1	-18.7	-17.3	-18.7	-9.2	-6.0	-8.5	-8.1	-8.3	-8.2	-8.2	-8.9
09/03/2005	-15.2	-14.8	-15.2	-14.9	-14.8	-14.7	-15.1	-14.6	-20.6	-18.1	-16.8	-18.7	-9.2	-5.5	-8.5	-8.1	-8.3	-8.2	-8.2	-8.9
10/03/2005	-14.9	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-20.3	-18.2	-16.7	-18.4	-9.6	-4.8	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
11/03/2005	-14.9	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-20.3	-18.2	-16.7	-18.4	-9.6	-4.8	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
12/03/2005	-14.9	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-20.3	-18.2	-16.7	-18.4	-9.6	-3.8	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1

13/03/2005	-14.9	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-19.8	-18.2	-16.7	-18.4	-9.6	-3.3	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
14/03/2005	-14.9	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-19.8	-18.2	-16.7	-18.4	-9.6	-3.3	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
15/03/2005	-14.9	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-19.8	-17.7	-16.7	-17.9	-9.6	-3.3	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
16/03/2005	-14.4	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-19.8	-17.7	-16.7	-17.9	-9.6	-2.8	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
17/03/2005	-14.4	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-19.8	-17.7	-16.7	-17.9	-9.6	-2.3	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
18/03/2005	-14.4	-14.5	-14.8	-14.9	-14.8	-14.5	-14.8	-14.6	-19.8	-17.7	-16.7	-17.9	-9.6	-1.2	-8.9	-8.6	-8.6	-8.4	-8.4	-9.1
19/03/2005	-14.4	-14.5	-14.8	-15.4	-15.3	-15.0	-15.3	-15.1	-20.3	-18.2	-16.7	-17.9	-9.6	0.3	-9.4	-9.1	-8.6	-8.4	-8.4	-9.1
20/03/2005	-14.4	-14.5	-14.8	-15.4	-15.3	-15.0	-15.3	-15.1	-20.3	-18.2	-16.7	-18.4	-10.1	0.3	-9.4	-9.1	-8.9	-8.9	-8.9	-9.6
21/03/2005	-14.4	-14.5	-14.8	-15.4	-15.3	-15.0	-15.3	-15.1	-20.3	-18.2	-16.7	-18.4	-10.1	0.3	-9.4	-9.1	-8.9	-8.9	-8.9	-9.6
22/03/2005	-14.4	-14.5	-14.8	-15.4	-15.3	-15.6	-15.8	-15.6	-20.3	-18.7	-17.3	-18.9	-10.1	2.3	-9.4	-9.1	-9.1	-8.9	-8.9	-9.6
23/03/2005	-14.4	-14.5	-14.8	-15.4	-15.3	-15.6	-15.8	-15.6	-20.8	-18.7	-17.3	-18.9	-10.6	9.1	-9.9	-9.6	-9.6	-9.4	-9.4	-10.1
24/03/2005	-14.4	-14.5	-14.8	-15.4	-15.3	-15.6	-16.3	-16.1	-21.3	-19.2	-17.8	-19.4	-10.6	19.5	-9.9	-9.6	-9.6	-9.4	-9.4	-10.1
25/03/2005	-14.9	-15.0	-14.8	-15.4	-15.3	-15.6	-16.3	-16.1	-21.3	-19.2	-17.8	-19.4	-10.6	19.1	-9.9	-10.1	-10.1	-9.9	-9.4	-10.6
26/03/2005	-14.9	-15.0	-14.8	-15.4	-15.3	-15.6	-16.3	-16.1	-21.9	-19.7	-17.8	-19.9	-11.1	14.9	-10.5	-10.1	-10.1	-9.9	-9.9	-10.6
27/03/2005	-15.5	-15.0	-14.8	-15.4	-15.3	-15.6	-16.3	-16.1	-21.9	-19.7	-18.3	-19.9	-11.1	17.0	-10.5	-10.1	-10.1	-9.9	-9.9	-10.6
28/03/2005	-15.5	-15.0	-15.3	-15.4	-15.3	-15.6	-16.3	-16.1	-21.9	-19.7	-18.3	-19.9	-11.1	17.5	-11.0	-10.6	-10.7	-10.4	-9.9	-11.1
29/03/2005	-15.8	-15.5	-15.4	-15.9	-15.7	-15.9	-16.3	-15.7	-22.3	-20.2	-18.6	-20.4	-11.6	1.4	-11.0	-10.8	-10.7	-10.5	-10.6	-11.3
30/03/2005	-15.8	-15.5	-15.4	-15.9	-15.7	-15.9	-16.3	-15.7	-22.3	-20.2	-18.6	-20.4	-11.6	-2.3	-11.0	-10.8	-10.7	-10.5	-10.6	-11.3
31/03/2005	-16.3	-16.0	-15.9	-15.9	-15.7	-15.9	-16.3	-15.7	-22.8	-20.7	-19.1	-20.9	-11.6	-4.3	-11.0	-10.8	-10.7	-10.5	-10.6	-11.3
01/04/2005	-16.3	-16.0	-15.9	-16.4	-15.7	-15.9	-16.3	-15.7	-22.8	-20.7	-19.1	-20.9	-12.1	-4.8	-11.5	-11.3	-11.2	-11.0	-11.1	-11.8
02/04/2005	-16.8	-16.0	-15.9	-16.4	-16.2	-16.4	-16.3	-15.7	-22.8	-20.7	-19.1	-20.9	-12.1	-5.8	-11.5	-11.3	-11.2	-11.0	-11.1	-11.8
03/04/2005	-16.8	-16.0	-16.4	-16.4	-16.2	-16.4	-16.8	-15.7	-22.8	-20.7	-19.1	-20.9	-12.1	-6.9	-11.5	-11.3	-11.4	-11.3	-11.3	-11.8
04/04/2005	-16.8	-16.5	-16.4	-16.4	-16.2	-16.4	-16.8	-16.2	-22.3	-20.7	-19.1	-20.9	-12.6	-6.9	-12.0	-11.8	-11.4	-11.3	-11.3	-12.3
05/04/2005	-17.3	-16.5	-16.4	-16.9	-16.8	-16.4	-16.8	-16.2	-22.3	-20.7	-19.1	-20.9	-12.6	-6.9	-12.0	-11.8	-11.4	-11.3	-11.3	-12.3

Table C.7 Temperature measurements of Gauge T7 at Shaft A and Gauge T7 at Shaft T																				
	10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
	A-D2-T7-10	A-D2-T7-09	A-D2-T7-08	A-D2-T7-07	A-D2-T7-06	A-D2-T7-05	A-D2-T7-04	A-D2-T7-03	A-D2-T7-02	A-D2-T7-01	T-D2-T7-01	T-D2-T7-02	T-D2-T7-03	T-D2-T7-04	T-D2-T7-05	T-D2-T7-06	T-D2-T7-07	T-D2-T7-08	T-D2-T7-09	T-D2-T7-10
	0.45	0.44	0.42	0.40	0.39	0.38	0.37	0.36	0.36	0.35	0.20	0.20	0.22	0.23	0.25	0.30	0.35	0.36	0.38	0.40
10/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.7	10.8	14.9	10.4	10.6	11.2	11.1	14.0	14.3	13.4
11/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	-3.2	-1.2	7.7	5.0	7.8	9.3	9.9	13.2	13.3	12.6
12/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	-2.8	-2.0	5.3	2.7	5.4	6.9	7.7	10.9	11.1	10.9
13/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	-6.4	-4.7	2.9	0.4	3.7	5.3	6.2	9.4	9.7	9.6
14/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	-9.9	-7.5	0.6	-1.9	2.0	3.7	4.7	8.0	8.2	8.3
15/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	-11.4	-9.1	-1.1	-3.3	0.7	2.5	3.4	6.8	6.9	7.2
16/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	-12.9	-10.7	-2.6	-4.7	-0.6	1.2	2.2	5.7	5.7	6.0
17/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	-14.5	-12.4	-4.3	-6.1	-1.9	-0.1	0.9	4.6	4.4	5.1
18/01/2005	?	?	12.1	11.6	11.4	11.3	11.1	11.1	4.7	4.8	-15.4	-13.6	-5.8	-7.1	-3.0	-0.9	0.1	3.5	3.7	4.2
19/01/2005	?	?	11.8	11.6	11.2	11.3	10.8	10	4.2	3.9	-16.3	-14.7	-7.3	-8.4	-4.1	-2.0	-1.0	2.5	2.8	3.2
20/01/2005	?	?	11.8	11.6	11.2	11.3	10.8	10.8	3.7	3.4	-16.9	-15.2	-8.4	-9.5	-4.6	-2.5	-1.5	2.0	2.2	2.7
21/01/2005	?	?	11.3	11.0	10.6	11.3	10.8	10.8	3.0	2.7	-15.7	-14.0	-7.6	-9.0	-5.0	-2.8	-1.8	1.1	1.4	2.0
22/01/2005	?	?	9.1	9.0	8.5	9.4	9.0	9.1	2.2	1.9	-20.3	-19.2	-11.2	-12.1	-7.0	-4.4	-3.3	0.6	0.9	1.4
23/01/2005	0.0	0.0	6.9	6.9	6.6	7.9	7.2	7.1	1.4	1.3	-22.9	-21.2	-13.2	-13.6	-8.5	-6.0	-4.3	-0.5	-0.1	0.4
24/01/2005	?	?	4.8	5.0	4.5	5.8	5.4	5.4	0.7	0.6	-24.0	-22.2	-14.3	-14.6	-9.5	-7.0	-5.4	-1.5	-1.2	-0.1
25/01/2005	?	?	3.5	4.2	3.5	4.9	4.7	4.6	0.4	-0.1	-24.1	-23.3	-14.3	-15.3	-10.2	-7.7	-6.3	-2.6	-2.1	-1.1
26/01/2005	?	?	2.5	2.8	2.1	3.6	3.3	3.3	-0.5	-0.6	-25.0	-24.0	-14.7	-15.8	-10.6	-9.9	-6.9	-4.8	-0.9	-1.1
27/01/2005	?	?	1.5	1.8	1.1	2.6	2.8	2.2	-2.0	-1.1	-25.6	-24.3	-15.8	-16.3	-11.2	-8.7	-7.3	-3.6	-3.2	-2.1
28/01/2005	?	?	1.0	1.3	0.6	2.0	1.8	1.7	-2.5	-2.1	-26.1	-24.8	-15.8	-16.3	-11.8	-9.2	-7.8	-4.1	-3.7	-2.6
29/01/2005	?	?	0.0	0.4	-0.2	1.3	1.1	1.6	-4.1	-3.1	-26.6	-25.6	-16.3	-17.0	-12.3	-9.9	-8.4	-4.7	-4.3	-3.3
30/01/2005	?	?	-0.5	-0.1	-0.7	0.7	0.6	1.1	-5.1	-4.7	-27.3	-26.4	-17.0	-17.7	-12.9	-10.7	-9.1	-5.3	-4.9	-3.9
31/01/2005	-1.8	?	-1.6	-1.2	-1.7	0.0	0.0	-0.1	-6.7	-6.1	-28.5	-27.5	-18.1	-18.6	-13.6	-11.1	-9.8	-6.1	-5.7	-4.7
01/02/2005	-2.4	?	-2.2	-1.8	-2.4	-0.6	-0.6	-0.7	-7.5	-6.8	-29.3	-28.6	-19.0	-19.5	-14.3	-11.8	-10.5	-6.7	-6.3	-5.4
02/02/2005	-2.9	?	-2.7	-2.3	-3.0	-1.1	-1.1	-1.2	-9.1	-7.9	-29.8	-29.1	-19.0	-19.5	-14.8	-12.3	-11.0	-7.3	-6.8	-5.9
03/02/2005	-3.9	?	-3.7	-3.4	-4.0	-2.1	-1.6	-1.7	-10.1	-8.9	-29.8	-29.1	-19.5	-20.0	-15.3	-12.8	-11.5	-7.8	-7.4	-6.4
04/02/2005	-4.4	?	-4.2	-3.9	-4.5	-2.7	-2.2	-2.2	-10.6	-9.9	-30.4	-29.6	-20.0	-20.5	-15.8	-13.4	-12.0	-8.3	-7.9	-6.9
05/02/2005	-5.5	?	-5.3	-4.4	-5.5	-3.2	-2.7	-3.3	-11.7	-10.9	-30.4	-30.1	-20.5	-21.0	-15.8	-13.4	-12.5	-8.8	-8.4	-7.4

06/02/2005	-6.0 ?	-5.8	-5.4	-6.0	-3.7	-3.7	-3.8	-12.2	-11.4	-30.9	-30.1	-20.5	-21.0	-16.4	-13.9	-13.0	-9.3	-8.9	-7.9
07/02/2005	-6.5 ?	-6.3	-5.9	-6.5	-4.7	-4.2	-4.3	-13.2	-11.9	-30.9	-30.6	-21.0	-21.5	-16.9	-14.4	-13.0	-9.3	-9.4	-8.4
08/02/2005	-7.0 ?	-6.8	-6.4	-7.1	-5.2	-4.7	-4.8	-13.7	-12.9	-30.9	-30.6	-21.0	-21.5	-16.9	-14.9	-13.5	-9.8	-9.9	-8.9
09/02/2005	-8.0 ?	-7.3	-6.9	-7.6	-5.7	-5.3	-5.3	-14.2	-13.5	-31.4	-30.6	-21.5	-22.0	-17.4	-15.4	-14.0	-10.3	-10.4	-9.4
10/02/2005	-8.6 ?	-7.9	-7.4	-8.1	-6.2	-5.8	-6.3	-14.7	-14.0	-31.4	-31.1	-21.5	-22.5	-17.9	-15.4	-14.5	-10.8	-10.9	-9.9
11/02/2005	-9.1 ?	-8.4	-8.0	-8.6	-6.8	-6.3	-6.8	-15.3	-14.5	-31.4	-31.1	-22.0	-22.5	-17.9	-15.9	-14.5	-11.3	-10.9	-10.4
12/02/2005	-9.6 ?	-8.9	-8.5	-9.1	-7.3	-6.8	-7.3	-15.8	-15.0	-31.9	-31.6	-22.0	-23.0	-18.4	-15.9	-15.0	-11.3	-11.4	-10.4
13/02/2005	-9.6 ?	-9.6	-9.2	-9.9	-7.9	-7.4	-7.7	-16.1	-15.5	-31.9	-31.6	-22.0	-23.0	-18.9	-16.4	-15.5	-11.8	-11.9	-10.9
14/02/2005	-10.1 ?	-10.1	-9.7	-10.4	-7.9	-7.9	-8.2	-16.6	-16.0	-31.9	-31.6	-22.5	-23.0	-18.9	-17.0	-15.5	-12.4	-12.4	-11.4
15/02/2005	-10.6 ?	-10.5	-9.9	-10.8	-8.5	-8.3	-8.8	-17.1	-16.3	-32.2	-31.9	-22.9	-23.4	-19.3	-17.3	-15.8	-12.8	-12.9	-11.8
16/02/2005	-11.0 ?	-10.8	-10.4	-11.0	-9.1	-8.7	-9.1	-17.4	-16.6	-32.3	-31.1	-22.2	-23.8	-19.6	-17.5	-16.2	-13.1	-13.2	-12.2
17/02/2005	-11.3 ?	-10.9	-10.6	-11.3	-9.4	-8.9	-9.3	-17.6	-16.8	-32.6	-32.4	-23.4	-24.2	-20.1	-17.9	-16.9	-13.4	-13.4	-12.7
18/02/2005	-11.3 ?	-10.9	-10.6	-11.3	-9.4	-8.9	-9.3	-17.6	-16.8	-32.5	-32.4	-23.5	-24.2	-20.0	-17.9	-16.9	-13.5	-13.5	-12.7
19/02/2005	-11.3 ?	-10.9	-10.6	-11.3	-9.4	-9.4	-9.8	-17.6	-16.8	-32.5	-32.4	-23.5	-24.2	-20.5	-18.4	-17.4	-14.0	-14.0	-13.3
20/02/2005	-11.8 ?	-10.9	-11.1	-11.3	-9.9	-9.4	-9.8	-18.1	-17.3	-33.0	-32.9	-23.5	-24.7	-20.5	-18.4	-17.4	-14.0	-14.0	-13.8
21/02/2005	-11.8 ?	-11.4	-11.1	-11.8	-9.9	-9.4	-9.8	-18.1	-17.3	-33.0	-32.9	-24.0	-24.7	-21.0	-18.9	-17.9	-14.5	-14.5	-13.8
22/02/2005	-11.8 ?	-11.4	-11.1	-11.8	-10.4	-9.9	-10.3	-18.6	-17.9	-33.0	-32.9	-24.0	-24.7	-21.0	-18.9	-17.9	-14.5	-15.0	-14.3
23/02/2005	-12.3 ?	-11.9	-11.6	-11.8	-10.4	-9.9	-10.3	-18.6	-17.9	-33.0	-32.9	-24.0	-25.3	-21.0	-18.9	-18.4	-15.0	-15.0	-14.3
24/02/2005	-12.4 ?	-12.0	-11.8	-12.3	-10.7	-10.5	-10.8	-18.9	-18.3	-32.8	-32.7	-24.2	-25.1	-21.3	-19.4	-18.6	-15.3	-15.4	-14.9
25/02/2005	-12.3 ?	-12.1	-11.9	-12.4	-10.8	-10.4	-10.9	-19.0	-18.3	-31.8	-31.8	-23.4	-25.0	-21.4	-19.5	-18.6	-15.4	-15.4	-14.9
26/02/2005	-12.3 ?	-12.1	-11.9	-12.4	-10.8	-10.4	-10.9	-19.0	-18.3	-32.8	-32.8	-23.9	-25.0	-21.4	-19.5	-18.6	-15.4	-15.4	-14.9
27/02/2005	-12.8 ?	-12.6	-12.4	-12.9	-11.3	-10.9	-11.4	-19.0	-18.8	-32.8	-32.8	-24.4	-25.5	-21.4	-19.5	-19.1	-15.9	-15.9	-15.4
28/02/2005	-12.8 ?	-12.6	-12.4	-12.9	-11.3	-10.9	-11.4	-19.5	-18.8	-33.3	-32.8	-24.4	-25.5	-21.9	-20.0	-19.1	-15.9	-15.9	-15.4
01/03/2005	-13.3 ?	-13.1	-12.9	-12.9	-11.8	-11.4	-11.9	-19.5	-19.4	-33.3	-33.3	-24.9	-26.0	-21.9	-20.0	-19.6	-16.4	-16.4	-15.9
02/03/2005	-13.3 ?	-13.1	-12.9	-13.4	-11.8	-11.4	-11.9	-20.0	-19.4	-33.3	-33.3	-24.9	-26.0	-22.4	-20.6	-19.6	-16.4	-16.4	-15.9
03/03/2005	-13.3 ?	-13.1	-12.9	-13.4	-11.8	-11.4	-11.9	-20.0	-19.4	-30.7	-30.7	-22.9	-24.5	-21.4	-20.0	-19.6	-16.4	-16.4	-15.9
04/03/2005	-13.3 ?	-13.1	-12.9	-12.9	-11.8	-11.4	-11.9	-19.5	-19.4	-29.2	-29.7	-21.9	-23.5	-20.9	-19.5	-19.1	-15.9	-15.9	-15.9
05/03/2005	-13.3 ?	-13.1	-12.9	-12.9	-11.8	-11.4	-11.9	-19.5	-18.8	-29.2	-29.2	-21.4	-23.5	-20.4	-19.0	-18.6	-15.9	-15.9	-15.4
06/03/2005	-12.8 ?	-12.6	-12.4	-12.9	-11.8	-11.4	-11.9	-19.0	-18.8	-28.7	-29.2	-21.4	-23.0	-20.4	-19.0	-18.6	-15.3	-15.9	-15.4
07/03/2005	-12.8 ?	-12.6	-12.4	-12.9	-11.8	-11.4	-11.9	-19.0	-18.8	-28.7	-28.7	-21.4	-23.0	-20.4	-19.0	-18.6	-15.3	-15.9	-15.4
08/03/2005	-12.8 ?	-12.6	-12.4	-12.9	-11.8	-11.4	-11.9	-19.0	-18.8	-27.2	-27.2	-20.4	-22.0	-19.9	-18.5	-18.1	-14.8	-15.4	-14.9
09/03/2005	-12.3 ?	-12.1	-12.4	-12.4	-11.3	-11.4	-11.9	-18.5	-18.3	-27.2	-27.2	-19.9	-22.0	-19.4	-18.0	-17.6	-14.8	-14.9	-14.9
10/03/2005	-11.6 ?	-11.4	-11.1	-11.4	-10.5	-10.6	-11.3	-17.7	-17.6	-26.7	-27.0	-20.0	-21.8	-19.1	-17.9	-17.4	-14.4	-14.8	-14.6
11/03/2005	-11.1 ?	-10.9	-10.6	-10.9	-9.9	-10.1	-11.3	-17.2	-17.6	-26.7	-27.0	-20.0	-21.8	-19.1	-17.9	-17.4	-14.4	-14.8	-14.6
12/03/2005	-10.6 ?	-10.3	-10.0	-10.4	-9.9	-10.1	-10.8	-17.2	-17.1	-26.7	-27.0	-20.0	-21.8	-19.1	-17.9	-17.4	-14.4	-14.8	-14.6

13/03/2005	-10.1 ?	-9.8	-10.0	-9.9	-9.4	-9.6	-10.3	-16.7	-17.1	-26.7	-27.0	-20.0	-21.8	-19.1	-17.9	-17.4	-14.4	-14.8	-14.6
14/03/2005	-8.0 ?	-9.8	-9.5	-9.9	-9.4	-9.6	-10.3	-16.7	-16.6	-26.2	-26.5	-19.4	-21.8	-19.1	-17.9	-17.4	-14.4	-14.8	-14.6
15/03/2005	-6.5 ?	-8.8	-9.5	-9.9	-9.4	-9.6	-10.3	-16.7	-16.6	-25.7	-25.9	-18.9	-21.2	-18.6	-17.4	-16.9	-13.9	-14.3	-14.1
16/03/2005	-6.0 ?	-5.2	-10.1	-10.9	-9.9	-10.1	-10.8	-17.2	-17.1	-25.7	-25.9	-18.9	-21.2	-18.6	-17.4	-16.9	-13.9	-14.3	-14.1
17/03/2005	-6.0 ?	-4.2	-7.6	-11.4	-10.5	-10.6	-11.4	-17.2	-17.1	-26.2	-26.4	-19.4	-21.2	-18.6	-17.4	-16.9	-13.9	-14.3	-14.1
18/03/2005	-5.4 ?	-3.7	-5.0	-11.9	-11.0	-10.6	-11.4	-17.7	-17.6	-26.7	-27.0	-20.0	-21.7	-19.1	-17.9	-16.9	-13.9	-14.3	-14.1
19/03/2005	-5.4 ?	-3.7	-2.9	-5.2	-11.0	-11.1	-11.9	-17.7	-17.6	-27.2	-27.0	-20.0	-21.7	-19.1	-17.9	-17.4	-14.4	-14.8	-14.6
20/03/2005	-5.4 ?	-3.7	-1.9	-3.2	-5.1	-11.1	-11.9	-17.7	-17.6	-26.7	-27.0	-20.5	-22.3	-19.6	-18.4	-17.4	-14.4	-14.8	-14.6
21/03/2005	-4.4 ?	-3.2	-1.4	-2.7	-1.5	-10.6	-11.4	-17.7	-17.6	-27.7	-27.9	-20.5	-22.3	-19.6	-18.4	-17.9	-14.9	-14.8	-14.6
22/03/2005	-5.4 ?	-3.7	-1.4	-2.7	-1.5	-3.4	-11.4	-18.2	-18.1	-28.8	-28.4	-21.5	-22.8	-20.1	-18.9	-17.9	-14.9	-15.3	-15.1
23/03/2005	-5.9 ?	-4.7	-1.9	-3.2	-1.5	-2.9	-5.7	-18.7	-18.6	-29.3	-29.0	-21.5	-23.3	-20.6	-18.9	-18.4	-15.5	-15.8	-15.6
24/03/2005	-6.5 ?	-5.7	-2.4	-3.7	-2.0	-2.9	-4.6	-18.7	-18.6	-22.1	-23.2	-16.4	-18.6	-17.6	-16.9	-16.9	-14.5	-14.8	-14.5
25/03/2005	-7.0 ?	-6.8	-2.9	-4.2	-2.5	-2.9	-4.6	-18.7	-19.1	-28.2	-28.3	-21.0	-22.8	-19.6	-18.4	-17.9	-14.5	-14.8	-14.5
26/03/2005	-7.5 ?	-7.3	-3.4	-5.3	-3.5	-3.4	-4.6	-18.2	-19.1	-28.2	-28.8	-21.6	-23.3	-20.6	-18.9	-18.4	-15.5	-15.8	-15.0
27/03/2005	-8.0 ?	-8.3	-3.9	-5.8	-4.5	-4.0	-5.1	-18.2	-19.6	-28.7	-29.3	-22.1	-23.3	-20.6	-19.4	-18.9	-16.0	-15.8	-15.6
28/03/2005	-8.5 ?	-8.8	-5.0	-6.8	-5.0	-5.0	-5.7	-18.7	-19.6	-29.2	-29.3	-22.1	-23.8	-21.1	-19.4	-18.9	-16.0	-16.3	-16.1
29/03/2005	-9.4 ?	-9.4	-5.7	-7.5	-6.1	-5.8	-6.6	-18.9	-19.9	-26.0	-28.0	-20.9	-23.0	-20.9	-20.1	-19.5	-16.5	-16.7	-16.2
30/03/2005	-9.9 ?	-9.9	-6.2	-8.5	-7.2	-6.8	-7.1	-7.8	-19.9	-11.2	-23.4	-16.8	-18.9	-17.8	-17.5	-17.5	-14.4	-15.2	-15.1
31/03/2005	-10.4 ?	-10.4	-7.2	-9.0	-7.7	-7.4	-7.6	-6.7	-16.8	-9.7	-16.2	-15.3	-17.4	-16.3	-16.0	-16.0	-13.4	-14.2	-13.6
01/04/2005	-10.9 ?	-10.9	-7.7	-9.5	-8.2	-7.9	-8.6	-6.2	-4.8	-9.7	-10.1	-13.2	-16.8	-15.8	-15.0	-15.0	-12.4	-13.1	-13.1
02/04/2005	-11.4 ?	-10.9	-8.7	-10.0	-8.7	-8.4	-9.1	-6.2	-5.3	-9.3	-9.0	-2.4	-15.8	-14.7	-14.5	-14.4	-11.9	-12.6	-12.6
03/04/2005	-11.9 ?	-11.4	-9.2	-10.5	-9.2	-8.9	-9.6	-6.7	-6.4	-19.4	-18.1	-6.2	-14.3	-15.3	-13.9	-13.9	-11.4	-12.1	-12.1
04/04/2005	-11.9 ?	-11.9	-9.7	-11.0	-9.7	-9.4	-10.1	-7.8	-7.4	-23.6	-23.2	-12.3	-11.6	-18.8	-17.6	-17.0	-14.0	-14.2	-13.6
05/04/2005	-12.4 ?	-11.9	-10.2	-11.0	-10.2	-9.9	-10.6	-8.8	-8.4	-22.2	-21.7	-10.8	-10.6	-16.8	-16.1	-15.9	-13.4	-13.7	-13.6

Table C.8 Temperature measurements of Gauge T8 at Shaft A and Gauge T6 at Shaft T																				
	10	9	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	9	10
	A-D2-T8-10	A-D2-T8-09	A-D2-T8-08	A-D2-T8-07	A-D2-T8-06	A-D2-T8-05	A-D2-T8-04	A-D2-T8-03	A-D2-T8-02	A-D2-T8-01	T-D2-T6-01	T-D2-T6-02	T-D2-T6-03	T-D2-T6-04	T-D2-T6-05	T-D2-T6-06	T-D2-T6-07	T-D2-T6-08	T-D2-T6-09	T-D2-T6-10
	0.60	0.61	0.63	0.65	0.65	0.65	0.58	0.51	0.45	0.38	0.40	0.55	0.60	0.65	0.70	0.72	0.75	0.75	0.75	0.75
10/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.9	11.1	10.6	11.0	11.0	11.3	11.7	11.8	12.5	10.6
11/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	10.5	10.6	10.8	11.1	11.1	11.1	11.4	12.0	12.7	10.6
12/01/2005	11.0	11.5	11.2	11.3	11.3	12.1	12.3	12.4	12.6	14.6	8.6	8.9	9.6	10.0	10.3	10.4	10.8	11.3	11.8	9.9
13/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	7.5	7.8	8.4	9.0	9.2	9.4	9.9	10.4	10.9	9.1
14/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	6.4	6.6	7.3	7.9	8.1	8.4	9.1	9.4	10.0	8.3
15/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	5.5	5.5	6.4	6.9	6.9	7.5	8.2	8.5	9.0	7.1
16/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	4.8	4.4	5.5	6.0	6.2	6.4	7.3	7.6	7.9	6.3
17/01/2005	11.1	11.7	11.2	11.4	11.5	12.2	12.5	12.5	12.7	14.7	3.7	3.4	4.6	5.1	5.3	5.9	6.4	6.7	7.1	5.4
18/01/2005	11.3	12.9	12.6		10.6	11.2	11.5		6.9	6.3	2.6	2.7	3.5	4.1	4.5	5.0	5.4	5.4	5.9	4.7
19/01/2005	10.9	12.9	12.6		10.7	10.9	11.3		6.5	5.7	1.7	1.9	2.7	3.2	3.5	4.1	4.4	4.7	4.8	3.8
20/01/2005	10.9	12.9	12.6	?	10.7	10.9	11.3	?	6.0	5.2	1.2	1.4	2.1	2.7	3.0	3.5	3.9	4.2	4.3	3.3
21/01/2005	10.4	12.4	12.0	?	10.2	9.9	9.7	?	2.8	0.3	0.6	0.7	1.5	2.2	2.5	2.9	3.2	3.5	3.6	2.7
22/01/2005	7.5	9.2	9.1	?	7.1	6.8	6.6	?	-0.5	-3.5	-1.0	-0.8	1.0	1.6	2.0	2.9	2.7	3.0	3.0	2.2
23/01/2005	5.0	6.4	6.4	?	4.3	4.1	3.5	?	-3.3	-6.7	-2.0	-2.0	0.5	1.1	1.4	2.3	2.2	2.5	2.5	2.2
24/01/2005	2.1	3.3	3.6	?	1.4	1.4	0.9	?	-6.5	-9.2	-7.6	-3.1	-0.5	0.6	0.9	1.8	1.7	2.0	2.0	1.6
25/01/2005	0.6	1.9	2.0	?	0.3	0.5	-0.4	?	-7.9	-10.0	-8.0	-5.0	-1.3	0.5	1.0	1.3	1.8	1.9	1.9	1.3
26/01/2005	0.1	0.7	0.9	?	-0.1	-0.3	-1.1	?	-9.6	-11.4	-9.0	-6.6	-2.3	-0.3	0.0	0.7	1.4	1.5	1.1	0.5
27/01/2005	-0.4	0.2	0.0	?	-1.1	-1.3	-2.6	?	-11.7	-12.9	-9.7	-8.1	-3.2	-0.8	-0.5	0.2	0.9	1.0	1.1	0.5
28/01/2005	-0.9	-0.3	0.1	?	-1.1	-1.8	-3.1	?	-13.2	-14.0	-10.8	-9.2	-4.2	-1.4	-1.0	-0.3	0.4	0.5	0.6	0.0
29/01/2005	-1.6	-1.1	-0.3	?	-2.2	-2.8	-3.9	?	-14.6	-15.5	-11.8	-10.7	-4.9	-2.4	-1.9	-1.1	-0.4	-0.2	-0.2	-0.9
30/01/2005	-2.6	-1.6	-1.3	?	-3.2	-3.8	-5.1	?	-16.1	-16.5	-12.8	-12.3	-5.5	-3.5	-2.9	-1.7	-1.2	-1.0	-1.1	-1.9
31/01/2005	-4.6	-3.2	-2.9	?	-4.9	-5.7	-6.6	?	-17.2	-17.5	-13.9	-14.4	-6.5	-4.5	-4.0	-2.9	-2.2	-1.9	-1.9	-3.0
01/02/2005	-6.0	-4.5	-4.1	?	-6.3	-7.0	-8.1	?	-18.9	-18.7	-14.7	-15.4	-6.8	-5.2	-4.7	-3.7	-2.8	-2.7	-2.6	-3.7
02/02/2005	-7.1	-5.5	-5.7	?	-7.8	-8.1	-9.3	?	-19.4	-19.7	-15.7	-16.9	-7.3	-6.2	-5.7	-4.2	-3.9	-3.7	-3.6	-4.7
03/02/2005	-8.6	-7.1	-6.7	?	-8.8	-9.6	-10.2	?	-20.4	-20.3	-16.2	-17.4	-8.3	-6.7	-6.2	-5.2	-4.9	-4.8	-4.7	-5.2
04/02/2005	-9.6	-8.1	-7.5	?	-9.8	-10.1	-11.2	?	-20.9	-20.8	-16.7	-17.4	-8.3	-7.2	-7.2	-6.2	-5.4	-5.3	-5.2	-6.3
05/02/2005	-10.1	-9.1	-8.5	?	-10.4	-11.1	-11.8	?	-21.5	-21.3	-17.2	-18.4	-9.4	-7.7	-7.7	-6.9	-6.5	-6.3	-5.7	-6.8

06/02/2005	-11.2	-9.6	-9.1 ?	-11.4	-12.2	-12.8 ?	-22.0	-21.8	-17.8	-18.9	-9.9	-8.8	-8.3	-7.4	-7.0	-6.9	-6.2	-7.3
07/02/2005	-11.7	-10.7	-10.2 ?	-11.9	-12.7	-13.3 ?	-22.5	-22.3	-18.3	-19.4	-10.4	-9.3	-8.8	-7.9	-7.5	-7.4	-6.7	-7.8
08/02/2005	-12.7	-11.2	-10.8 ?	-12.9	-13.2	-13.8 ?	-23.0	-22.8	-18.8	-19.9	-10.4	-9.3	-9.3	-8.3	-8.0	-7.9	-7.3	-8.3
09/02/2005	-13.2	-11.7	-11.3 ?	-13.4	-13.7	-14.5 ?	-23.0	-22.8	-19.3	-20.4	-10.9	-9.8	-9.8	-9.2	-8.6	-8.4	-7.8	-8.9
10/02/2005	-13.7	-12.2	-11.9 ?	-13.9	-14.2	-14.9 ?	-23.5	-23.4	-19.3	-20.4	-11.5	-10.3	-10.3	-9.6	-9.2	-9.0	-8.9	-9.5
11/02/2005	-14.3	-12.7	-12.4 ?	-14.4	-14.7	-15.4 ?	-24.0	-23.4	-19.8	-21.0	-12.0	-10.8	-10.9	-10.1	-9.2	-9.5	-9.4	-9.5
12/02/2005	-14.8	-13.2	-12.8 ?	-15.0	-15.2	-15.9 ?	-24.0	-23.9	-20.4	-21.5	-12.0	-11.3	-10.9	-10.6	-9.7	-10.0	-10.0	-10.0
13/02/2005	-15.3	-13.8	-13.3 ?	-15.5	-15.8	-16.2 ?	-24.5	-24.2	-20.4	-21.5	-12.5	-11.8	-11.4	-10.6	-10.2	-10.0	-10.5	-10.5
14/02/2005	-15.8	-14.3	-13.9 ?	-15.5	-16.3	-16.7 ?	-24.5	-24.2	-20.9	-22.0	-13.0	-11.8	-11.9	-11.1	-10.7	-10.5	-10.5	-11.0
15/02/2005	-16.0	-14.8	-14.4 ?	-16.0	-16.7	-16.9 ?	-24.8	-24.6	-21.0	-22.2	-13.4	-12.0	-12.2	-11.5	-10.9	-10.8	-10.9	-11.4
16/02/2005	-16.5	-15.1	-14.7 ?	-16.6	-16.9	-17.4 ?	-25.0	-24.7	-21.3	-22.4	-13.8	-12.5	-12.6	-11.8	-11.4	-11.4	-11.4	-11.7
17/02/2005	-16.6	-15.3	-14.8 ?	-16.8	-17.0	-17.4 ?	-24.8	-24.4	-21.7	-22.5	-14.1	-13.2	-12.9	-12.3	-11.8	-11.8	-11.9	-12.1
18/02/2005	-16.6	-15.3	-14.9 ?	-16.8	-17.0	-17.4 ?	-24.8	-24.4	-21.7	-22.5	-14.1	-13.2	-13.4	-12.5	-12.4	-12.3	-11.9	-12.1
19/02/2005	-16.6	-15.3	-14.9 ?	-16.8	-17.0	-17.4 ?	-24.8	-24.4	-21.2	-22.5	-14.6	-13.7	-13.4	-13.0	-12.4	-12.3	-12.4	-12.7
20/02/2005	-16.6	-15.3	-14.9 ?	-16.8	-17.0	-17.4 ?	-24.8	-24.4	-21.2	-22.5	-14.6	-13.7	-13.9	-13.0	-12.9	-12.8	-12.9	-13.2
21/02/2005	-17.2	-15.8	-15.4 ?	-17.3	-17.5	-17.9 ?	-24.8	-25.0	-21.7	-23.0	-15.1	-14.2	-13.9	-13.5	-12.9	-12.8	-12.9	-13.2
22/02/2005	-17.2	-15.8	-15.4 ?	-17.3	-17.5	-17.9 ?	-24.8	-25.0	-21.7	-23.0	-15.1	-14.7	-14.3	-13.5	-13.4	-13.3	-13.4	-13.7
23/02/2005	-17.2	-15.8	-15.7 ?	-17.3	-17.5	-18.0 ?	-24.8	-25.0	-21.7	-23.0	-15.6	-14.7	-14.8	-14.0	-13.4	-13.3	-13.4	-13.7
24/02/2005	-17.5	-16.2	-15.9 ?	-17.6	-17.9	-18.1 ?	-24.9	-24.8	-22.1	-23.1	-15.9	-15.1	-14.8	-14.3	-13.9	-13.8	-14.0	-14.2
25/02/2005	-17.6	-16.3	-16.0 ?	-17.6	-17.9	-18.3 ?	-25.0	-24.9	-22.0	-23.1	-15.9	-15.2	-14.8	-14.3	-13.9	-14.0	-14.0	-14.2
26/02/2005	-17.6	-16.3	-16.1 ?	-17.6	-17.9	-18.3 ?	-25.0	-24.9	-22.0	-23.1	-15.9	-15.2	-15.1	-14.3	-13.9	-14.0	-14.0	-14.8
27/02/2005	-18.1	-16.8	-16.1 ?	-18.1	-18.4	-18.5 ?	-25.5	-25.4	-22.0	-23.1	-16.4	-15.2	-15.2	-14.9	-14.4	-14.5	-14.5	-14.8
28/02/2005	-18.1	-16.8	-16.6 ?	-18.1	-18.4	-19.1 ?	-25.5	-25.4	-22.5	-23.6	-16.4	-15.7	-15.8	-14.9	-14.4	-14.5	-14.5	-14.8
01/03/2005	-18.6	-17.3	-16.6 ?	-18.6	-18.9	-19.1 ?	-25.5	-25.4	-22.5	-23.6	-16.9	-15.7	-15.8	-15.5	-15.0	-15.0	-15.0	-15.3
02/03/2005	-18.6	-17.4	-16.6 ?	-18.6	-18.9	-19.1 ?	-25.5	-24.9	-22.5	-23.6	-16.9	-16.2	-15.8	-15.4	-15.0	-15.2	-15.0	-15.3
03/03/2005	-18.6	-17.4	-16.6 ?	-18.1	-18.4	-18.6 ?	-24.4	-24.4	-22.5	-23.1	-16.9	-16.2	-16.3	-15.4	-15.5	-15.2	-15.0	-15.4
04/03/2005	-18.1	-16.9	-16.4 ?	-18.1	-18.4	-18.2 ?	-24.4	-23.9	-22.0	-22.6	-16.9	-16.2	-15.7	-15.4	-15.0	-15.2	-15.0	-15.4
05/03/2005	-18.1	-16.9	-16.4 ?	-18.1	-18.4	-18.2 ?	-23.9	-23.9	-21.5	-22.1	-16.9	-15.7	-15.7	-15.4	-15.0	-15.2	-15.0	-15.4
06/03/2005	-18.1	-16.9	-16.4 ?	-17.6	-17.8	-18.0 ?	-23.4	-23.4	-21.5	-22.1	-16.4	-15.7	-15.7	-14.9	-15.0	-14.7	-14.5	-15.4
07/03/2005	-17.6	-16.9	-16.4 ?	-17.6	-17.8	-18.0 ?	-23.4	-23.4	-21.5	-22.1	-16.4	-15.7	-15.2	-14.9	-15.0	-14.7	-14.5	-15.4
08/03/2005	-17.6	-16.9	-16.4 ?	-17.6	-17.8	-18.0 ?	-23.4	-23.4	-21.0	-21.6	-16.4	-15.7	-15.1	-14.9	-14.4	-14.7	-14.5	-14.9
09/03/2005	-17.1	-15.9	-15.9 ?	-17.1	-16.8	-16.7 ?	-21.4	-20.3	-20.5	-20.6	-15.9	-15.2	-15.1	-14.9	-14.4	-14.2	-14.5	-14.9
10/03/2005	-15.6	-14.4	-14.0 ?	-15.2	-15.2	-14.8 ?	-19.3	-18.7	-19.7	-19.9	-15.7	-15.1	-14.9	-14.6	-14.2	-14.1	-14.1	-14.7
11/03/2005	-14.6	-13.4	-13.0 ?	-14.2	-13.6	-13.8 ?	-18.3	-17.6	-19.2	-19.4	-15.7	-15.1	-14.9	-14.6	-14.2	-14.1	-14.1	-14.7
12/03/2005	-13.6	-12.4	-11.9 ?	-13.2	-12.6	-12.3 ?	-17.2	-17.6	-18.7	-18.9	-15.7	-15.1	-14.9	-14.6	-14.2	-14.1	-14.1	-14.2

13/03/2005	-13.1	-11.9	-11.1?	-12.2	-12.1	-11.7?	-16.2	-16.6	-18.2	-18.9	-15.7	-15.0	-14.8	-14.6	-14.2	-14.1	-13.6	-14.2
14/03/2005	-12.6	-10.8	-10.4?	-11.2	-11.1	-11.2?	-15.7	-16.1	-17.7	-18.4	-15.7	-15.1	-14.8	-14.6	-14.2	-14.1	-13.6	-14.2
15/03/2005	-12.6	-11.3	-11.0?	-12.2	-12.1	-12.2?	-18.3	-19.2	-17.7	-18.4	-15.2	-15.1	-14.8	-14.1	-14.2	-14.1	-13.6	-14.2
16/03/2005	-13.6	-12.4	-11.8?	-13.2	-13.6	-13.8?	-19.8	-20.8	-18.2	-18.9	-15.2	-14.6	-14.3	-14.1	-13.7	-13.6	-13.6	-14.2
17/03/2005	-14.6	-13.4	-13.3?	-14.2	-14.6	-15.1?	-20.8	-21.3	-19.3	-19.4	-15.2	-14.6	-14.3	-14.1	-13.7	-13.6	-13.6	-14.2
18/03/2005	-15.1	-14.4	-14.1?	-15.3	-15.1	-15.6?	-21.3	-21.8	-19.3	-19.9	-15.2	-14.6	-14.3	-14.1	-13.7	-13.6	-13.6	-14.2
19/03/2005	-15.6	-14.9	-14.1?	-15.8	-16.1	-16.2?	-21.8	-21.8	-19.3	-20.4	-15.2	-14.6	-14.7	-14.1	-14.2	-13.6	-13.6	-14.2
20/03/2005	-15.1	-14.4	-14.1?	-15.3	-15.6	-15.4?	-20.3	-20.2	-19.3	-19.9	-15.7	-15.1	-14.9	-14.6	-14.2	-14.1	-14.1	-14.7
21/03/2005	-13.5	-12.8	-12.5?	-13.8	-14.1	-13.8?	-19.3	-20.3	-18.7	-19.4	-15.7	-15.3	-14.7	-14.6	-14.2	-14.1	-14.1	-14.7
22/03/2005	-14.1	-13.4	-13.0?	-14.3	-15.1	-15.4?	-21.3	-22.3	-19.8	-20.4	-15.7	-15.3	-15.2	-14.6	-14.2	-14.1	-14.1	-14.7
23/03/2005	-15.6	-14.9	-14.0?	-15.8	-16.2	-16.9?	-22.4	-22.8	-20.3	-21.4	-16.2	-15.3	-15.2	-15.1	-14.7	-14.6	-14.6	-15.2
24/03/2005	-16.1	-15.4	-15.0?	-16.3	-16.7	-17.4?	-23.4	-23.8	-20.8	-22.0	-16.2	-15.8	-15.7	-15.1	-15.2	-14.6	-14.6	-15.2
25/03/2005	-16.6	-15.9	-15.5?	-16.8	-17.2	-17.8?	-23.4	-23.8	-20.8	-22.0	-16.7	-15.8	-15.7	-15.6	-15.2	-14.6	-15.1	-15.7
26/03/2005	-17.1	-16.4	-16.0?	-17.3	-17.7	-18.3?	-23.9	-23.8	-21.3	-22.0	-16.7	-15.8	-15.7	-15.6	-15.2	-15.1	-15.1	-15.7
27/03/2005	-17.7	-17.0	-16.1?	-17.3	-18.2	-18.3?	-23.9	-24.3	-21.3	-22.5	-16.7	-16.3	-16.3	-15.6	-15.8	-15.1	-15.1	-15.7
28/03/2005	-17.7	-17.0	-16.7?	-17.8	-18.2	-18.7?	-23.9	-24.3	-21.8	-22.5	-17.2	-16.3	-16.3	-16.1	-15.8	-15.7	-15.6	-16.2
29/03/2005	-18.3	-17.5	-16.9?	-18.1	-18.6	-19.0?	-24.4	-24.8	-22.0	-22.9	-17.4	-16.7	-16.5	-16.4	-15.9	-15.7	-15.7	-16.3
30/03/2005	-18.3	-17.5	-17.2?	-18.1	-18.6	-19.3?	-24.4	-24.8	-22.0	-22.9	-17.4	-16.7	-16.6	-16.4	-15.9	-15.7	-15.7	-16.3
31/03/2005	-18.8	-18.0	-17.4?	-18.6	-19.1	-19.3?	-24.9	-25.4	-22.5	-23.4	-17.4	-17.2	-17.1	-16.4	-16.4	-16.2	-16.2	-16.8
01/04/2005	-18.8	-18.0	-17.6?	-18.6	-19.1	-19.3?	-24.9	-25.4	-22.5	-23.4	-17.9	-17.2	-17.1	-16.9	-16.4	-16.2	-16.7	-16.8
02/04/2005	-18.8	-18.0	-17.6?	-19.1	-19.1	-19.8?	-24.9	-25.4	-22.5	-23.4	-17.9	-17.3	-17.1	-16.9	-16.4	-16.2	-16.7	-16.8
03/04/2005	-19.3	-18.5	-18.1?	-19.1	-19.6	-19.9?	-24.9	-25.4	-22.5	-23.4	-17.9	-17.2	-17.5	-16.9	-16.4	-16.2	-16.7	-16.8
04/04/2005	-19.3	-18.5	-18.1?	-19.1	-19.6	-20.0?	-24.9	-25.4	-22.5	-23.4	-17.9	-17.8	-17.5	-16.9	-16.9	-16.7	-16.7	-17.4
05/04/2005	-19.3	-18.5	-18.6?	-19.1	-19.6	-20.0?	-24.9	-25.4	-22.5	-23.4	-17.9	-17.8	-17.5	-16.9	-16.9	-16.7	-16.7	-17.4

Table C.9 Temperature measurements of Gauge T9 at Shaft T

	T-D2-T9-1	T-D2-T9-2	T-D2-T9-3	T-D2-T9-4	T-D2-T9-5	T-D2-T9-6	T-D2-T9-7	T-D2-T9-8	T-D2-T9-9	T-D2-T9-10	T-D2-T9-11	T-D2-T9-12	T-D2-T9-13
	0.41	0.45	0.48	0.51	0.55	0.63	0.70	0.66	0.63	0.60	0.56	0.53	0.50
10/01/2005	10.7	10.6	11.0	10.8	11.3	11.3	11.1	10.6	10.2	10.2	10.7	11.7	8.0
11/01/2005	10.3	10.4	10.2	10.3	10.7	10.7	10.5	10.4	10.1	9.9	10.6	11.4	8.1
12/01/2005	8.8	8.6	8.7	8.9	9.5	9.5	9.3	9.3	9.0	8.9	9.6	10.4	7.2
13/01/2005	6.2	5.8	7.0	7.4	8.1	8.1	8.1	8.1	7.8	7.6	8.3	9.1	6.1
14/01/2005	3.5	3.1	5.3	5.9	6.7	6.7	6.8	6.9	6.6	6.4	7.0	7.8	5.0
15/01/2005	2.2	2.0	3.7	4.4	5.1	5.2	5.4	5.3	5.1	5.1	5.8	6.3	3.7
16/01/2005	0.9	0.8	2.1	3.1	3.4	3.6	4.0	3.8	3.6	3.9	4.6	4.9	2.5
17/01/2005	-0.3	-0.3	0.4	1.6	1.9	2.1	2.6	2.3	2.1	2.7	3.4	3.4	1.3
18/01/2005	-5.4	-8.8	-0.6	-0.7	0.4	0.7	0.4	0.8	0.7	0.5	1.0	1.6	0.5
19/01/2005	-17.9	-20.7	-3.7	-1.1	-0.2	-0.2	-0.1	0.1	1.0	-0.2	0.2	0.3	-0.4
20/01/2005	-27.1	-28.5	-11.9	-7.3	-0.7	-0.7	-0.1	-0.4	-0.5	-0.7	-0.5	-0.2	1.5
21/01/2005	-33.6	-32.9	-17.8	-13.0	-5.8	-1.8	-1.1	-0.4	-0.5	-0.9	-0.6	-0.5	-1.5
22/01/2005	-39.2	-37.6	-23.5	-19.1	-11.9	-6.4	-4.1	-1.4	-1.0	-1.4	-1.1	-1.0	-2.1
23/01/2005	-45.5	-42.8	-29.7	-24.3	-18.0	-12.2	-9.3	-3.9	-2.0	-2.9	-1.6	-1.5	-3.1
24/01/2005	-50.0	-46.9	-35.0	-29.0	-23.2	-17.3	-14.4	-8.0	-4.6	-3.9	-3.1	-2.5	-5.1
25/01/2005	-50.0	-49.0	-38.5	-32.2	-27.0	-21.3	-18.9	-11.7	-7.4	-6.2	-5.4	-3.8	-6.5
26/01/2005	-50.0	-48.7	-39.6	-34.2	-29.1	-24.1	-21.9	-15.7	-12.2	-10.5	-9.6	-7.5	-9.3
27/01/2005	-50.0	-48.7	-39.6	-34.7	-29.7	-26.2	-23.4	-18.7	-15.8	-14.7	-13.6	-11.5	-12.4
28/01/2005	-50.0	-49.2	-40.6	-35.7	-30.7	-27.3	-25.0	-20.3	-17.8	-16.7	-15.7	-13.6	-14.5
29/01/2005	-50.0	-50.0	-41.2	-36.5	-31.8	-29.0	-26.5	-22.7	-19.9	-18.7	-17.7	-16.0	-16.6
30/01/2005	-50.0	-49.8	-41.2	-37.0	-32.3	-29.5	-27.6	-23.7	-21.9	-20.8	-18.8	-18.1	-18.1
31/01/2005	-50.0	-49.7	-41.8	-37.6	-33.3	-31.0	-28.8	-25.6	-23.4	-22.3	-21.4	-19.9	-19.8
01/02/2005	-50.0	-49.5	-42.0	-37.9	-33.6	-31.8	-29.6	-26.3	-24.2	-23.7	-22.2	-21.3	-20.9
02/02/2005	-50.0	-48.0	-39.9	-36.4	-32.6	-30.8	-29.1	-26.3	-24.7	-23.7	-22.7	-21.8	-21.5
03/02/2005	-49.0	-45.9	-37.8	-34.3	-31.1	-29.8	-28.6	-26.3	-24.7	-23.7	-23.2	-21.8	-22.0
04/02/2005	-47.4	-44.3	-36.3	-32.8	-30.0	-28.7	-27.5	-25.8	-24.7	-23.7	-23.2	-22.3	-22.0
05/02/2005	-44.8	-41.7	-34.8	-31.8	-29.0	-28.2	-27.0	-25.3	-24.2	-23.7	-23.2	-22.3	-22.0
06/02/2005	-42.8	-40.2	-33.8	-30.8	-28.0	-27.7	-26.5	-24.8	-24.2	-23.7	-23.2	-22.3	-22.0
07/02/2005	-41.8	-39.2	-32.7	-29.7	-27.5	-26.7	-26.0	-24.8	-24.2	-23.7	-23.2	-22.3	-22.0
08/02/2005	-40.2	-38.1	-31.7	-29.2	-27.0	-26.7	-26.0	-24.3	-24.2	-23.7	-23.2	-22.3	-22.5
09/02/2005	-39.7	-37.6	-30.7	-28.7	-26.5	-26.2	-25.5	-24.3	-24.2	-23.7	-23.2	-22.3	-22.5
10/02/2005	-38.7	-36.5	-30.2	-28.2	-26.0	-25.7	-25.5	-24.3	-24.2	-23.7	-23.2	-22.8	-22.5
11/02/2005	-38.2	-36.0	-30.2	-27.7	-26.0	-25.7	-25.5	-24.3	-24.2	-23.7	-23.2	-22.8	-23.1
12/02/2005	-37.2	-36.0	-29.7	-27.7	-26.0	-25.7	-25.0	-24.3	-24.2	-23.7	-23.2	-22.8	-23.1
13/02/2005	-36.7	-35.5	-29.2	-27.2	-25.5	-25.7	-25.0	-24.3	-24.2	-23.7	-23.2	-23.3	-23.1

14/02/2005	-36.1	-35.0	-28.7	-27.2	-25.5	-25.2	-25.0	-24.3	-24.2	-23.7	-23.7	-23.3	-23.1
15/02/2005	-35.5	-34.7	-28.6	-27.0	-25.3	-25.1	-25.0	-24.3	-24.3	-23.9	-23.8	-23.5	-23.2
16/02/2005	-34.8	-34.0	-28.5	-26.8	-25.2	-25.1	-25.0	-24.3	-24.3	-24.0	-23.9	-23.6	-23.3
17/02/2005	-34.4	-33.7	-28.0	-26.3	-25.0	-25.0	-24.9	-24.2	-24.4	-24.4	-24.1	-23.9	-23.8
18/02/2005	-33.9	-33.2	-28.0	-26.3	-25.0	-25.0	-24.9	-24.2	-24.4	-24.4	-24.1	-23.9	-23.8
19/02/2005	-33.4	-32.7	-28.0	-26.3	-25.0	-25.0	-24.9	-24.2	-24.4	-24.4	-24.1	-23.9	-23.8
20/02/2005	-32.9	-32.7	-27.5	-26.3	-25.0	-25.0	-24.9	-24.2	-24.4	-24.4	-24.1	-24.4	-24.3
21/02/2005	-32.9	-32.7	-27.5	-26.3	-25.0	-25.0	-24.9	-24.2	-24.9	-24.9	-24.6	-24.4	-24.3
22/02/2005	-32.9	-32.7	-27.5	-26.3	-25.0	-25.0	-24.9	-24.2	-24.9	-24.9	-24.6	-24.4	-24.3
23/02/2005	-32.4	-32.2	-27.5	-26.3	-25.0	-25.0	-24.9	-24.2	-24.9	-24.9	-24.6	-24.4	-24.3
24/02/2005	-32.0	-31.9	-27.2	-25.9	-24.9	-25.1	-25.1	-24.7	-25.0	-25.2	-24.9	-24.9	-24.7
25/02/2005	-31.9	-31.9	-27.2	-25.9	-24.9	-25.1	-25.1	-24.7	-25.0	-25.1	-24.9	-24.9	-24.8
26/02/2005	-31.4	-31.4	-27.2	-25.9	-24.9	-25.1	-25.1	-24.7	-25.0	-25.1	-24.9	-24.9	-24.8
27/02/2005	-31.4	-31.4	-27.2	-25.9	-24.9	-25.1	-25.1	-24.7	-25.0	-25.1	-24.9	-24.9	-24.8
28/02/2005	-31.4	-31.9	-27.2	-25.9	-24.9	-25.1	-25.1	-24.7	-25.0	-25.1	-24.9	-24.9	-24.8
01/03/2005	-31.4	-31.9	-27.2	-25.9	-24.9	-25.1	-25.1	-24.7	-25.0	-25.1	-24.9	-25.4	-25.3
02/03/2005	-31.4	-31.9	-27.2	-25.9	-24.9	-25.1	-25.1	-24.7	-25.0	-25.6	-25.4	-25.4	-25.3
03/03/2005	-30.9	-30.8	-26.7	-25.3	-24.9	-25.1	-25.1	-24.7	-25.0	-25.6	-25.4	-25.4	-25.3
04/03/2005	-29.9	-29.8	-26.1	-24.8	-24.4	-24.6	-24.6	-24.2	-24.5	-25.1	-24.9	-24.9	-24.8
05/03/2005	-29.4	-29.3	-25.6	-24.3	-23.9	-24.0	-24.1	-24.2	-24.5	-24.6	-24.4	-24.4	-24.3
06/03/2005	-28.8	-28.8	-25.1	-24.3	-23.4	-23.5	-23.6	-23.6	-24.0	-24.1	-23.9	-24.4	-24.3
07/03/2005	-28.3	-28.3	-25.1	-23.8	-23.4	-23.5	-23.6	-23.1	-23.5	-24.1	-23.9	-23.9	-23.8
08/03/2005	-28.3	-28.3	-24.6	-23.8	-22.9	-23.0	-23.1	-23.1	-23.5	-23.6	-23.4	-23.9	-23.8
09/03/2005	-27.8	-27.7	-24.1	-23.3	-22.4	-22.5	-22.6	-22.6	-23.0	-23.1	-23.4	-23.3	-23.2
10/03/2005	-27.4	-27.4	-23.7	-22.8	-22.1	-22.4	-22.5	-22.2	-22.6	-22.8	-22.8	-22.9	-22.8
11/03/2005	-27.4	-27.4	-23.7	-22.8	-22.1	-22.4	-22.5	-22.2	-22.6	-22.8	-22.8	-22.9	-22.8
12/03/2005	-26.9	-26.9	-23.7	-22.3	-22.1	-22.4	-22.5	-22.2	-22.6	-22.8	-22.8	-22.9	-22.3
13/03/2005	-26.9	-26.9	-23.2	-22.3	-21.6	-21.9	-22.0	-22.2	-22.6	-22.8	-22.8	-22.9	-22.3
14/03/2005	-26.9	-26.9	-23.2	-22.3	-21.6	-21.9	-22.0	-21.7	-22.1	-22.3	-22.8	-22.9	-22.2
15/03/2005	-26.4	-26.4	-22.7	-21.8	-21.6	-21.9	-22.0	-21.7	-22.1	-22.3	-22.3	-22.3	-22.2
16/03/2005	-25.9	-25.9	-22.7	-21.8	-21.1	-21.4	-21.5	-21.7	-22.1	-22.3	-22.3	-22.3	-22.2
17/03/2005	-25.9	-25.9	-22.7	-21.8	-21.1	-21.4	-21.5	-21.7	-22.1	-22.3	-22.3	-22.3	-22.2
18/03/2005	-25.9	-25.9	-22.7	-21.8	-21.1	-21.4	-21.5	-21.7	-22.1	-22.3	-22.3	-22.3	-22.2
19/03/2005	-26.4	-26.4	-22.7	-21.8	-21.1	-21.4	-21.5	-21.7	-22.1	-22.3	-22.3	-22.3	-22.2
20/03/2005	-26.4	-26.4	-22.7	-21.8	-21.1	-21.4	-21.5	-21.7	-22.1	-22.3	-22.3	-22.3	-22.2
21/03/2005	-26.4	-26.4	-22.7	-21.8	-21.1	-21.4	-21.5	-21.7	-22.1	-22.3	-22.3	-22.9	-22.8
22/03/2005	-26.9	-26.9	-22.7	-21.8	-21.6	-21.9	-22.0	-21.7	-22.1	-22.8	-22.8	-22.9	-22.8
23/03/2005	-26.9	-26.9	-22.7	-21.8	-21.1	-21.9	-22.0	-21.7	-22.6	-22.8	-22.8	-22.9	-22.8
24/03/2005	-26.9	-27.4	-22.7	-21.8	-21.6	-21.9	-22.0	-21.7	-22.1	-22.8	-22.8	-22.9	-22.8
25/03/2005	-25.8	-26.9	-22.7	-22.3	-21.6	-21.9	-22.0	-22.2	-22.6	-22.8	-22.8	-23.4	-23.3
26/03/2005	-25.3	-26.4	-23.2	-22.3	-21.6	-22.4	-22.5	-22.2	-22.6	-23.3	-23.3	-23.4	-23.3
27/03/2005	-25.3	-26.4	-23.2	-22.3	-22.1	-22.4	-22.5	-22.7	-23.1	-23.3	-23.3	-23.9	-23.8
28/03/2005	-25.3	-26.4	-23.2	-22.8	-22.1	-22.4	-23.0	-22.7	-23.1	-23.3	-23.8	-23.9	-23.8
29/03/2005	-25.4	-26.5	-23.6	-22.9	-22.5	-22.8	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.1
30/03/2005	-25.9	-26.5	-23.6	-22.9	-22.5	-22.8	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.1
31/03/2005	-25.9	-25.4	-23.6	-22.9	-22.5	-22.8	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.3
01/04/2005	-25.9	-24.4	-22.1	-22.9	-22.5	-22.8	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.4
02/04/2005	-25.9	-24.4	-20.1	-22.3	-22.5	-22.8	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.4
03/04/2005	-25.9	-24.4	-19.1	-20.3	-22.5	-22.8	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.4
04/04/2005	-25.9	-24.4	-18.0	-18.2	-21.4	-22.8	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.4
05/04/2005	-25.9	-24.4	-18.0	-17.2	-19.4	-21.3	-23.1	-23.0	-23.5	-23.9	-24.0	-24.3	-24.4